United States Department of Agriculture

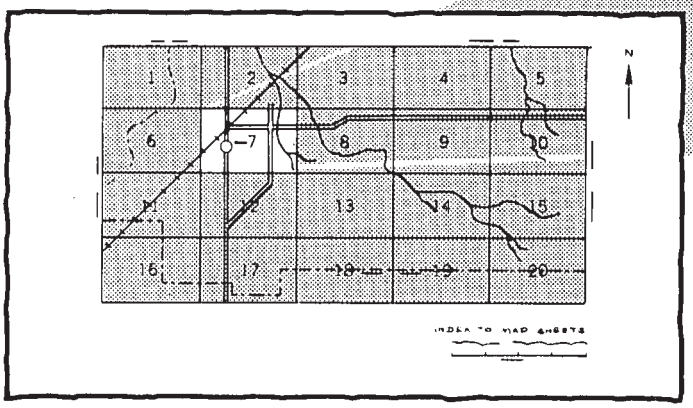
Soil Conservation Service

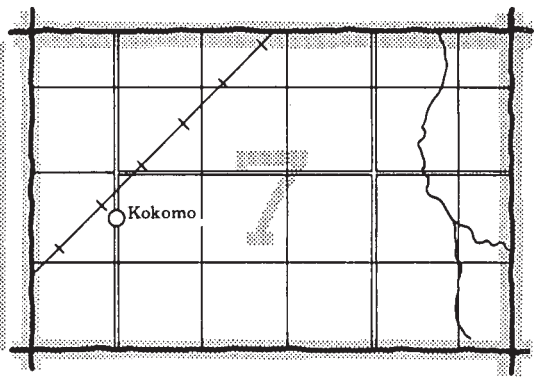
In cooperation with United States Department of the Interior, Bureau of Indian Affairs; University of Idaho, College of Agriculture; and University of Nevada, Agricultural Experiment Station

Soil Survey of Duck Valley Indian Reservation, Idaho and Nevada

HOW TO USE

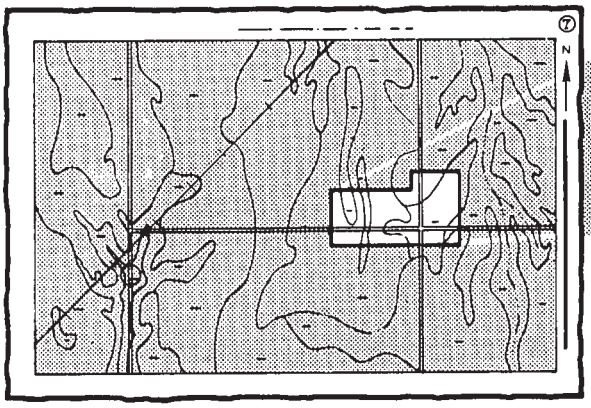
1. Locate your area of interest on the "Index to Map Sheets"

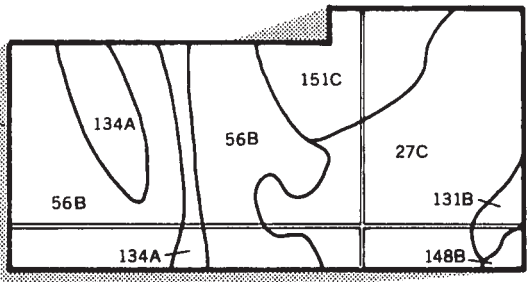




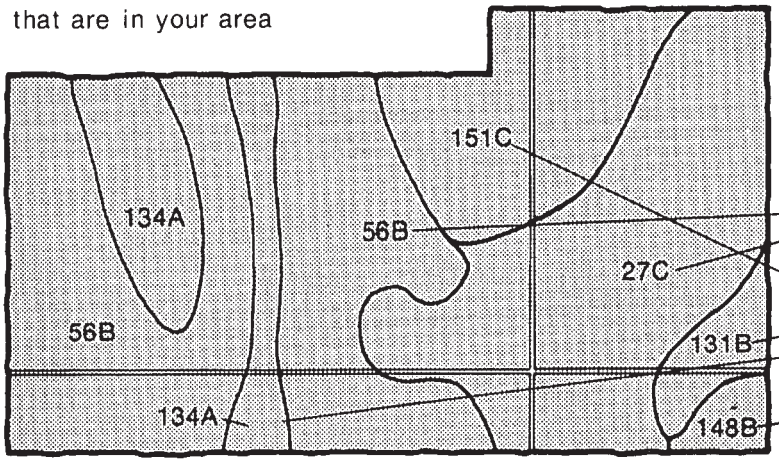
2. Note the number of the map sheet and turn to that sheet.

3. Locate your area of interest on the map sheet.





4. List the map unit symbols that are in your area

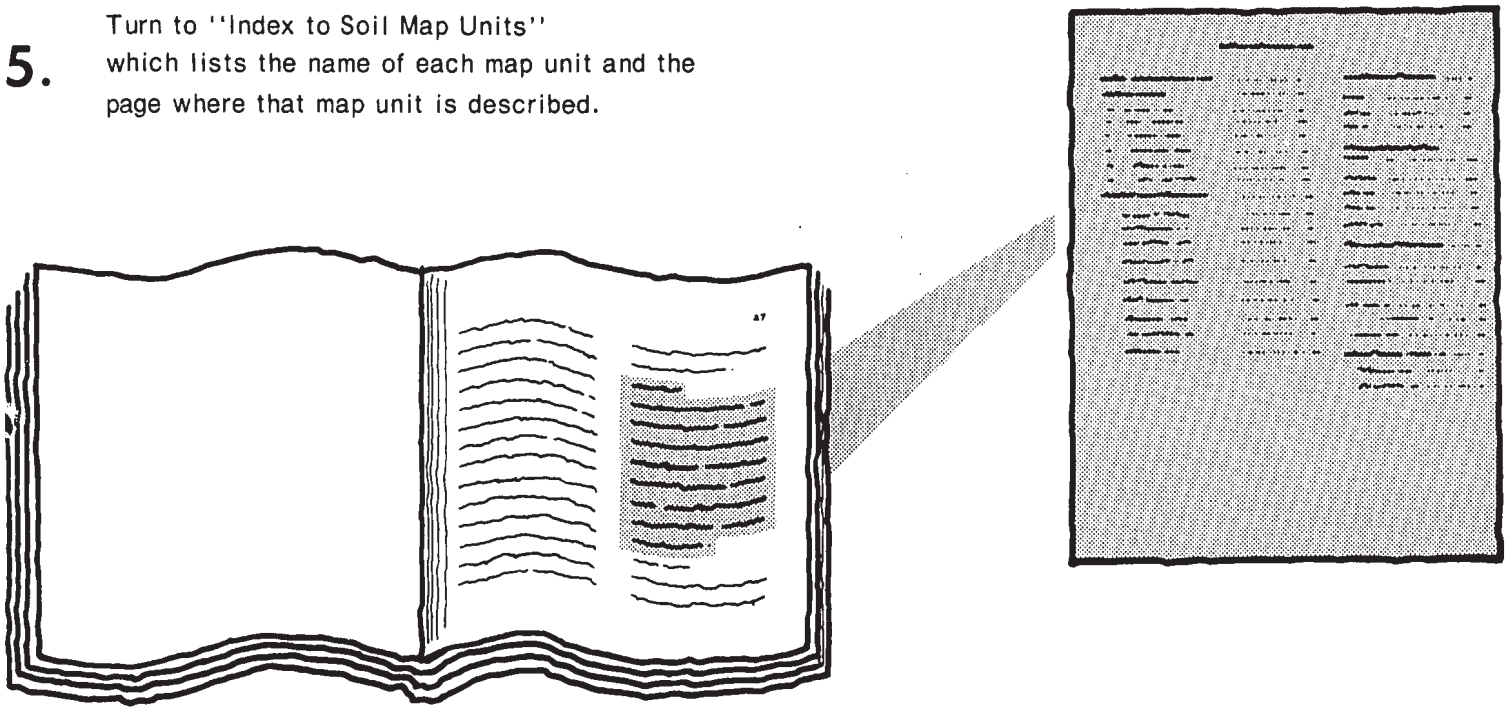


Symbols

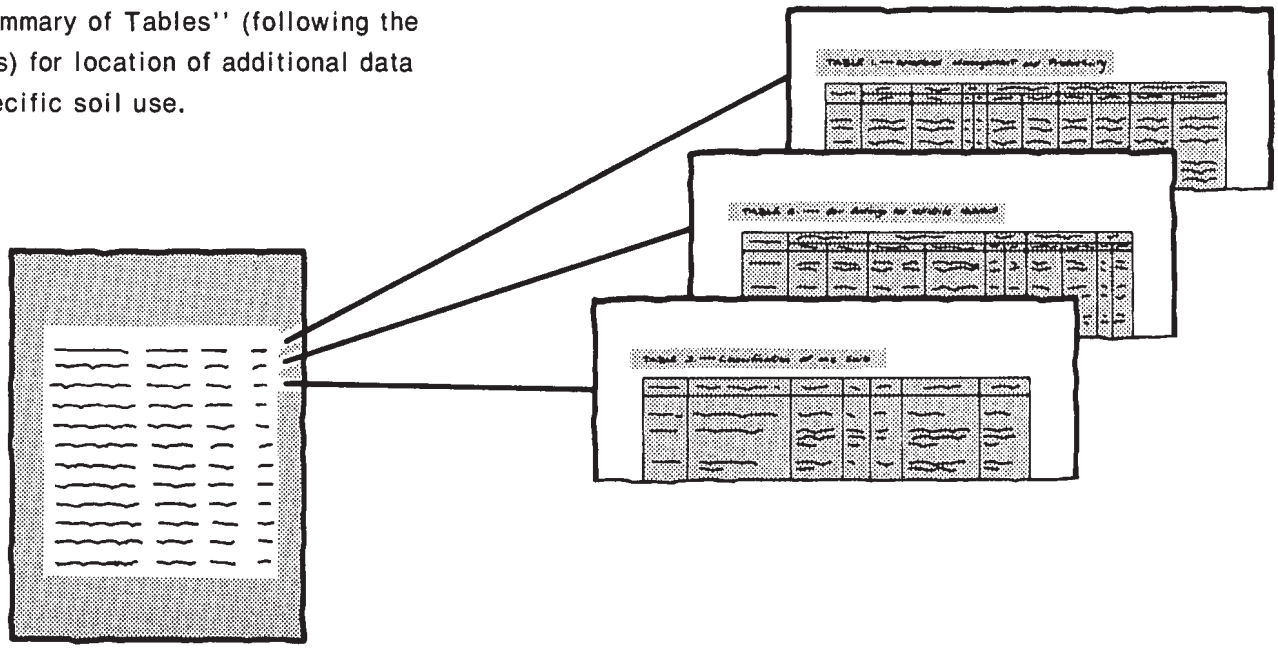
- 27C
- 56B
- 131B
- 134A
- 148B
- 151C

THIS SOIL SURVEY

5. Turn to "Index to Soil Map Units" which lists the name of each map unit and the page where that map unit is described.



6. See "Summary of Tables" (following the Contents) for location of additional data on a specific soil use.



7. Consult "Contents" for parts of the publication that will meet your specific needs. This survey contains useful information for farmers or ranchers, foresters or agronomists; for planners, community decision makers, engineers, developers, builders, or homebuyers; for conservationists, recreationists, teachers, or students; for specialists in wildlife management, waste disposal, or pollution control.

This soil survey is a publication of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other federal agencies, state agencies including the Agricultural Experiment Stations, and local agencies. The Soil Conservation Service has leadership for the federal part of the National Cooperative Soil Survey. In line with Department of Agriculture policies, benefits of this program are available to all, regardless of race, color, national origin, sex, religion, marital status, or age.

Major fieldwork for this soil survey was completed in 1980-81. Soil names and descriptions were approved in 1983. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 1983. This survey was made cooperatively by the Soil Conservation Service; the Bureau of Indian Affairs; the University of Idaho, College of Agriculture; the University of Nevada, Agricultural Experiment Station; and Duck Valley Tribal Council. It is part of the technical assistance furnished to the Duck Valley and Bruneau River Soil Conservation Districts.

Soil maps in this survey may be copied without permission. Enlargement of these maps, however, could cause misunderstanding of the detail of mapping. If enlarged, maps do not show the small areas of contrasting soils that could have been shown at a larger scale.

Cover: Grass hay on Hayspur clay loam and Blackfoot silt loam. Cavanaugh and Sattley soils are on hills and mountains in background. Willows beyond hayfield border the Owyhee River.

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Taxonomic Units

Issued May 1986

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Summary of Tables

Foreword

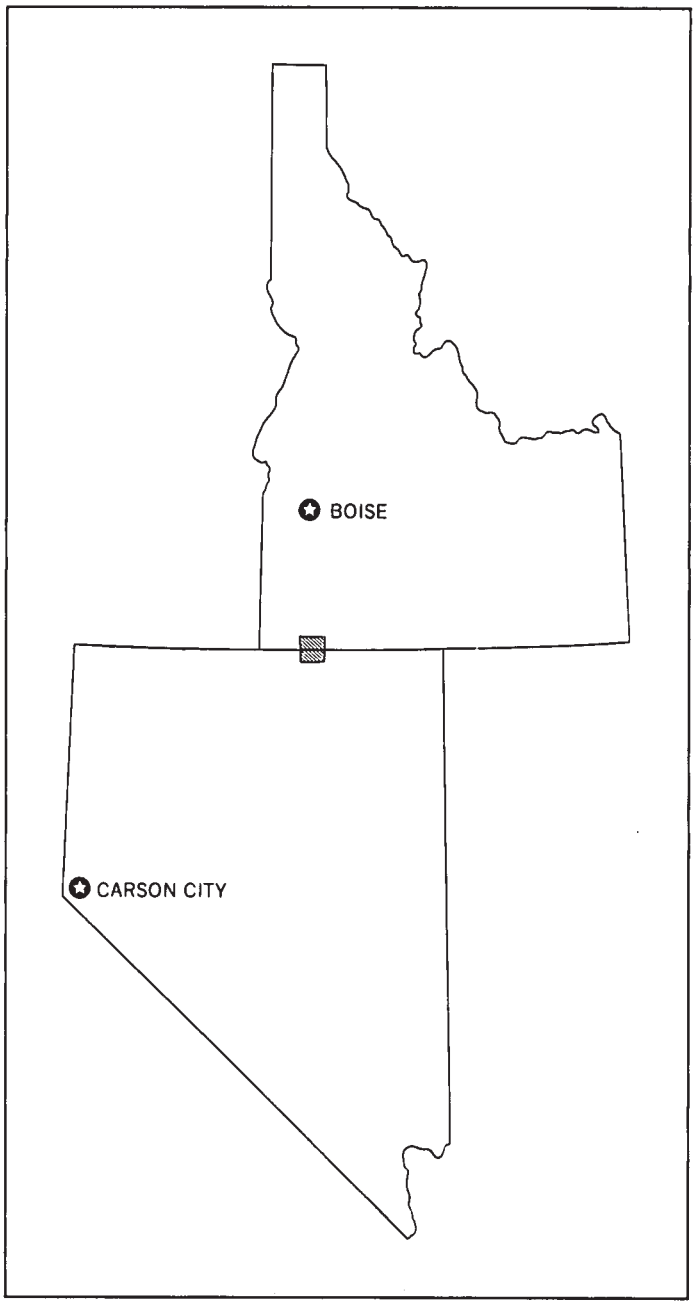
This soil survey contains information that can be used in land-planning programs on the Duck Valley Indian Reservation, Idaho and Nevada. It contains predictions of soil behavior for selected land uses. The survey also highlights limitations and hazards inherent in the soil, improvements needed to overcome the limitations, and the impact of selected land uses on the environment.

This soil survey is designed for many different users. Farmers, ranchers, foresters, and agronomists can use it to evaluate the potential of the soil and the management needed for maximum food and fiber production. Planners, community officials, engineers, developers, builders, and home buyers can use the survey to plan land use, select sites for construction, and identify special practices needed to insure proper performance. Conservationists, teachers, students, and specialists in recreation, wildlife management, waste disposal, and pollution control can use the survey to help them understand, protect, and enhance the environment.

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are shallow to bedrock. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

These and many other soil properties that affect land use are described in this soil survey. Broad areas of soils are shown on the general soil map. The location of each soil is shown on the detailed soil maps. Each soil in the survey area is described. Information on specific uses is given for each soil. Help in using this report and additional information are available at the local office of the Soil Conservation Service or the Cooperative Extension Service.

Stanley N. Hobson
State Conservationist
Soil Conservation Service



Location of Duck Valley Indian Reservation in Elko County, Nevada, and Owyhee County, Idaho.

Soil Survey of Duck Valley Indian Reservation, Idaho and Nevada

By Thomas W. Hahn, Soil Conservation Service

Fieldwork by Albert Matsuura, Thomas W. Hahn, Pamela L. Keller, Michael L. Petersen, Karen R. Langersmith, Richard C. Edlund, and Michael A. Gondek, Soil Conservation Service, and Filbert Kinlichee, College of Ganado

United States Department of Agriculture, Soil Conservation Service
In cooperation with
United States Department of the Interior, Bureau of Indian Affairs;
University of Idaho, College of Agriculture; and
University of Nevada, Agricultural Experiment Station

DUCK VALLEY INDIAN RESERVATION is in the southwestern part of Idaho and in the north-central part of Nevada. It has a total area of 289,819 acres, or 453 square miles. The total area in Idaho is 145,545 acres, and the total area in Nevada is 144,274 acres.

The survey is centered in the broad valleys of the Owyhee River and the lower reaches of Blue Creek. The soils in the valleys vary widely in texture, drainage, and depth. Included in the survey area are basalt plateaus to the east and west of the valleys and hills and mountains to the south. The soils on the uplands in the area generally are shallow or moderately deep, are well drained, and commonly contain rock fragments.

The purpose of this survey is to provide soil and range information to the Bureau of Indian Affairs and the residents of the Reservation for use in resource planning. An interim report was prepared and presented to the Bureau of Indian Affairs in July 1982. This publication is a modification of the interim report, and it replaces the earlier report.

The soils in the survey area were mapped at two levels of intensity. The arable soils, about 27 percent of the area, were mapped at the more detailed level, which is suitable for agricultural planning and for determining potentially irrigable land. In addition, the arable soils were investigated to a depth of 84 inches rather than to the standard depth of 60 inches. The nonarable soils were mapped at the less detailed level, which is suitable for planning rangeland management.

General Nature of the Survey Area

This section gives general information about the survey area. It discusses physiography, history and settlement, agriculture and water supply, and climate.

Physiography

The survey area is on the southern edge of the Owyhee volcanic plateau. The Bull Run Mountains are to the south. Topography and relief of the area are varied.

The western and northeastern parts of the survey area consist of undulating volcanic plateaus and tablelands. The bedrock in these areas is mainly basalt and some rhyolite of Miocene age. These areas are characterized by extensive, generally north-south trending faults. The Owyhee River has cut a deep canyon through the western plateau. Elevation ranges from 5,400 to 7,500 feet. Local relief generally is less than 800 feet.

The southern part of the area consists of steep hills and mountains that are composed mainly of Tertiary rhyolitic volcanics; however, there are smaller areas of granite and sedimentary rock of various ages. Elevation is 5,400 to 7,800 feet. Local relief generally is 800 to 1,800 feet.

The central part of the survey area consists of the valleys of Blue Creek and the Owyhee River. Elevation in this part of the area is 5,260 to 5,600 feet. Local relief generally is less than 50 feet. These wide structural valleys were formed by the uplifting of the fault blocks of the adjacent basalt plateaus or by the down-dropped fault block that underlies the valleys, or by both. The valleys have been partially filled with alluvium eroded from the surrounding uplands. The alluvial deposits are as much as 300 feet thick. The highest alluvial deposit consists of early Pleistocene valley fill material that has been well dissected. During recent geologic time, the Owyhee River and Blue Creek have eroded into the older alluvium and have formed broad, nearly level flood plains.

The Owyhee River, flowing in a generally southeast to northwest direction, drains most of the survey area. The extreme northeastern part of the area is drained by Marys Creek, a tributary of the Bruneau River. The West Fork of the Owyhee River drains the southwestern part of the area.

History and Settlement

The survey area is the ancestral lands of the Western Shoshone and Northern Paiute tribes. The members lived mostly in bands, or extended family groups, and they roamed a wide area of land, hunting, fishing, and gathering seed. Their first contact with white men probably was in the early 1800's, when fur trappers explored the area. During the period of the westward expansion of the United States, contacts with white men became more frequent. Conflicts over the land and resources increased.

A treaty of peace between the Western Shoshone people and the U.S. Government was signed in 1863. After the treaty, many Indians turned from their former nomadic way of life to agriculture. Indian leaders, notably Captain Sam, urged that land be set aside for their people in Duck Valley. This remote valley was one of the few remaining unsettled areas in Northeastern Nevada that was suitable for farming. In 1877, President Rutherford B. Hayes signed an order setting aside the Duck Valley Indian Reservation for the Shoshone tribes. In 1886, a band of Northern Paiutes, led by Paddy Cap, settled in Duck Valley and the Reservation was enlarged on the Idaho side. In 1910, an additional tract of land was added to the northeastern corner, enlarging the Reservation to its present boundaries.

Agriculture and Water Supply

Irrigated farming began in Duck Valley shortly before the Duck Valley Indian Reservation was established. The Indians built canals and raised hay in the loamy dark soils of the Owyhee River flood plain. They made an effort to depart from their nomadic traditions and establish a way of life that included farming and ranching.

Hay has always been the most important crop in Duck Valley. Grain was raised in the late 1800's, when a flour mill was constructed in Owyhee, but the lack of a dependable supply of irrigation water and poor grain harvests caused the mill to be abandoned.

Beef cattle production is currently the main agricultural enterprise. Cattle graze the rangelands from spring through fall, and they graze the valley pastures in winter.

Alfalfa and grass hay are the most important crops on the farmland of the fertile Owyhee River flood plain. Native grass hay is cut on the wet meadows in Pleasant Valley and along Blue Creek. Sizeable areas of land on the benches have recently been cleared of sagebrush and planted to alfalfa and barley. Most of the hay grown on the Reservation is used locally for livestock feed in winter, but a small amount is sold to outside markets.

Soon after the Reservation was established it became clear that irrigation water from the Owyhee River was necessary for successful farming. After several periods of drought and crop failure, a dam was finally built in 1937. Wildhorse Dam was constructed by the Bureau of Reclamation in cooperation with the Bureau of Indian Affairs specifically for the purpose of impounding water for use in the irrigation of Reservation lands. The dam is located on the Owyhee River, about 15 miles upstream from the Reservation. Wildhorse Reservoir originally had a storage capacity of 33,500 acre-feet. Its capacity was enlarged in 1969 to 73,500 acre-feet.

A similar reservoir, Mountain View Lake, also provides storage for irrigation water. This reservoir is in the central part of the valley. It is an impoundment on Boyle Creek, which drains part of the high eastern plateau. Water from the Owyhee River is also diverted into Boyle Creek to supply additional water for storage.

Climate

Prepared by the National Climatic Center, Asheville, North Carolina.

In this survey area, the summers are hot, especially at the lower elevations, and the winters are cold. Precipitation is normally light at the lower elevations throughout the year. At the higher elevations, precipitation is much greater and snow accumulates to a considerable depth. Much of the snowmelt irrigates crops in nearby valleys.

Table 1 gives data on temperature and precipitation for the survey area as recorded at Owyhee, Nevada, in the period 1951-80. Table 2 shows probable dates of the

first freeze in fall and the last freeze in spring. Table 3 provides data on length of the growing season.

In winter, the average temperature is 30 degrees F and the average daily minimum temperature is 20 degrees. The lowest temperature on record, which occurred at Owyhee on January 12, 1963, is -25 degrees. In summer, the average temperature is 64 degrees and the average daily maximum temperature is 80 degrees. The highest recorded temperature, which occurred on July 19, 1960, is 98 degrees.

Growing degree days, shown in table 1, are equivalent to "heat units." During the month, growing degree days accumulate by the amount that the average temperature each day exceeds a base temperature (40 degrees). The normal monthly accumulation is used to schedule single or successive plantings of a crop between the last freeze in spring and the first freeze in fall.

Of the total annual precipitation, 7 inches, or 45 percent, usually falls in April through September. The growing season for most crops falls within this period. In 2 years out of 10, the rainfall in April through September is less than 4 inches. The heaviest 1-day rainfall during the period of record was 2.67 inches at Owyhee on June 4, 1963. Thunderstorms occur on about 13 days each year, and most occur in summer.

The average seasonal snowfall is 62 inches. The greatest snow depth at any one time during the period of record was 37 inches. On an average of 23 days, at least 1 inch of snow is on the ground. The number of such days varies greatly from year to year.

The average relative humidity in midafternoon is about 45 percent. Humidity is higher at night, and the average at dawn is about 70 percent. The sun shines 90 percent of the possible time in summer and 65 percent in winter. The prevailing wind is from the west-northwest. Average windspeed is highest, 8 miles per hour, in spring.

Every few years a blizzard strikes the survey area with high winds and drifting snow. Even at lower elevations, snow remains on the ground for many weeks and livestock suffer.

How This Survey Was Made

The Soil Conservation Service soil survey crew completed the soil mapping during the field seasons of 1980 and 1981. A Soil Conservation Service range conservationist collected rangeland information concurrently with the soil mapping. Range technicians employed by the Soil Conservation Service and the Bureau of Indian Affairs assisted with the fieldwork.

The Bureau of Indian Affairs Soils Laboratory, Gallup, New Mexico, performed tests on some samples collected during the course of the survey. The National Soil Survey Laboratory, Lincoln, Nebraska, tested samples from several important soil series.

This survey was made to provide information about the soils and miscellaneous areas in the survey area. The information includes a description of the soils and miscellaneous areas and their location and a discussion of their suitability, limitations, and management for specified uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They dug many holes to study the soil profile, which is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biologic activity.

The soils and miscellaneous areas in the survey area are in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind or segment of the landscape. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landscape, a soil scientist develops a concept or model of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with considerable accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Individual soils on the landscape commonly merge gradually into one another as their characteristics gradually change. To construct an accurate map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted color, texture, size, and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

While the soil survey was in progress, samples of some of the soils in the area were collected for laboratory analyses and for engineering tests. Soil scientists interpreted the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils were field tested through observation of the soils in different uses and under different levels of management. Some interpretations were modified to fit local conditions, and some new interpretations were developed to meet local needs. Data were assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management were assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can state with a fairly high degree of probability that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

General Soil Map Units

The general soil map at the back of this publication shows broad areas that have a distinctive pattern of soils, relief, and drainage. Each map unit on the general soil map is a unique natural landscape. Typically, a map unit consists of one or more major soils or miscellaneous areas and some minor soils or miscellaneous areas. It is named for the major soils or miscellaneous areas. The soils or miscellaneous areas making up one unit can occur in other units but in a different pattern.

The general soil map can be used to compare the suitability of large areas for general land uses. Areas of suitable soils or miscellaneous areas can be identified on the map. Likewise, areas that are not suitable can be identified.

Because of its small scale, the map is not suitable for planning the management of a farm or field or for selecting a site for a road or building or other structure. The soils in any one map unit differ from place to place in slope, depth, drainage, and other characteristics that affect management.

The general map units in this survey have been grouped into general kinds of landscape for broad interpretive purposes. Each of the broad groups and the map units in each group are described in the following pages.

Map Unit Description

Soils on flood plains and lakebeds

Three map units are on these landscape positions. They make up about 11 percent of the survey area.

1. Zola-Hayspur

Nearly level, moderately well drained and poorly drained, very deep soils that have a loamy subsoil; on flood plains

This map unit is in the central part of the survey area. Slope is 0 to 2 percent. Elevation ranges from 5,260 to 5,420 feet. The average annual precipitation is about 15 inches, the average annual air temperature is about 44 degrees F, and the average frost-free period is 80 to 100 days.

This unit makes up about 4 percent of the survey area. It is about 55 percent Zola soils and 27 percent Hayspur soils. The remaining 18 percent is components of minor extent.

Zola soils are in the better drained areas on flood plains. The soils are very deep and moderately well drained. They formed in alluvium derived from mixed sources. The surface layer is medium textured and moderately fine textured. The subsoil is medium textured. The substratum to a depth of 84 inches or more is medium textured to coarse textured.

Hayspur soils are in drainageways and depressional areas on flood plains. The soils are very deep and poorly drained. They formed in alluvium derived from mixed sources. The surface layer is moderately fine textured. The subsoil is medium textured. The substratum to a depth of 84 inches or more is gravelly and is coarse textured.

Of minor extent in this unit are Tucker and Blackfoot soils.

Most areas of this unit are used for hay and pasture. A few areas are used as habitat for wetland wildlife and as homesites.

The main limitations of this unit for the production of hay and pasture and for homesite development are a seasonal high water table and flooding.

This unit provides habitat for many species of duck and other waterfowl.

2. Disabel Variant-Tucker-Crooked Creek

Nearly level, moderately well drained, somewhat poorly drained, and very poorly drained, very deep soils that have a clayey subsoil; on flood plains

This map unit is in the north-central part of the survey area. Slope is 0 to 2 percent. Elevation ranges from 5,290 to 5,320 feet. The average annual precipitation is about 15 inches, the average annual air temperature is about 44 degrees F, and the average frost-free period is 80 to 100 days.

This unit makes up about 6 percent of the survey area. It is about 25 percent Disabel Variant soils, 18 percent Tucker soils, and 16 percent Crooked Creek soils. The remaining 41 percent is components of minor extent (fig. 1).

Disabel Variant soils are very deep and moderately well drained. They formed in alluvium derived from mixed sources. The surface layer is medium textured. The subsoil is fine textured and moderately fine textured. The substratum to a depth of 84 inches or more is medium textured.

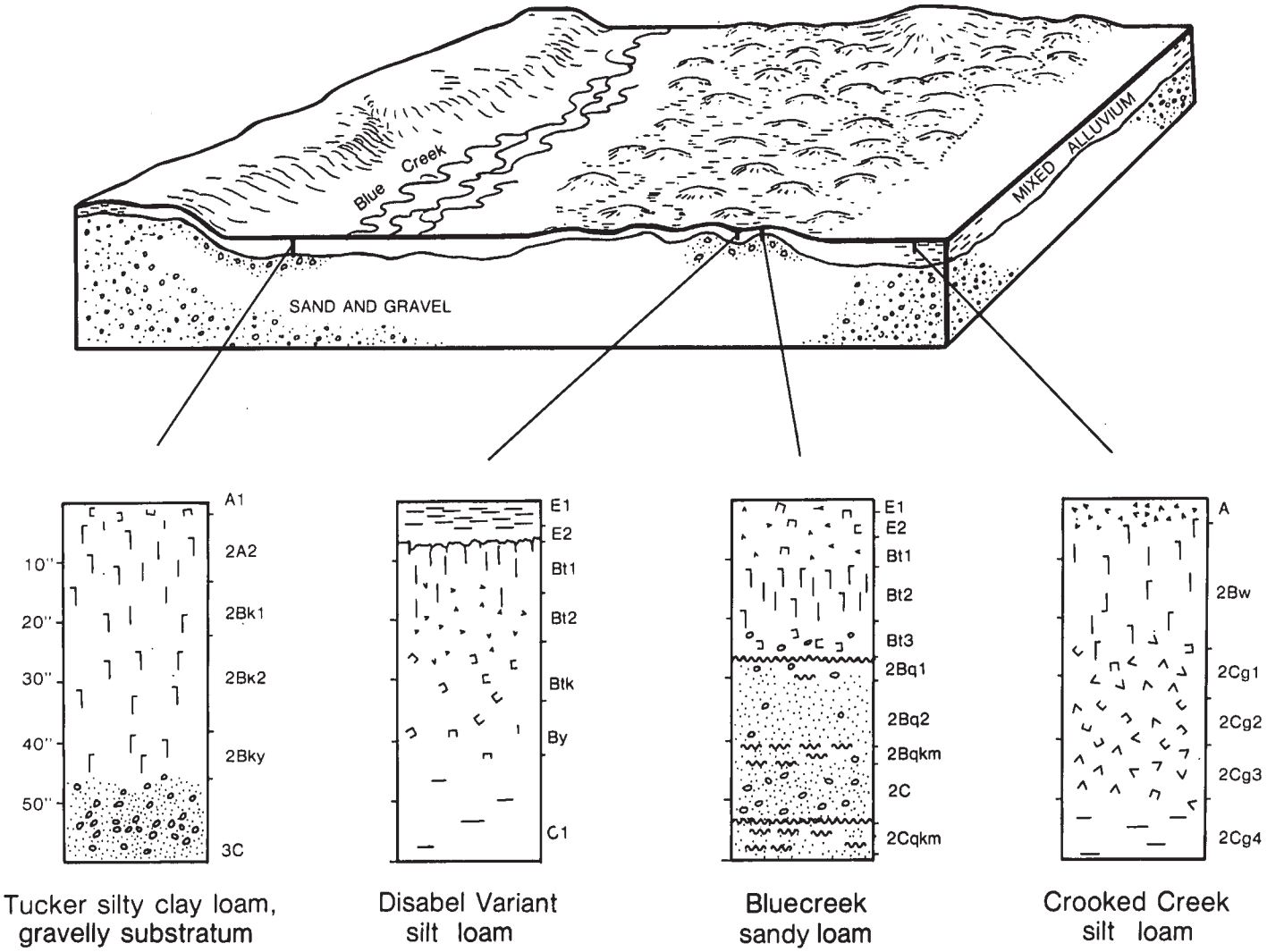


Figure 1.—Typical landscape and underlying material in an area of general soil map unit 2.

Tucker soils are very deep and somewhat poorly drained. They formed in alluvium derived from mixed sources. The surface layer is fine textured. The subsoil is fine textured, moderately fine textured, and medium textured. The substratum is very gravelly and is moderately coarse textured to a depth of 84 inches or more.

Crooked Creek soils are very deep and very poorly drained. They formed in alluvium derived from mixed sources. The surface layer is medium textured. The subsoil is fine textured. The substratum is moderately fine textured and medium textured to a depth of 84 inches or more.

Of minor extent in this unit are Bear Lake, Bluecreek Variant, Tucker Variant, and Boulder Lake soils on flood plains and basins. Also of minor extent are Paynecreek Variant and Bluecreek soils on remnants of low terraces. The Paynecreek Variant and Bluecreek soils are well drained, are moderately deep or very deep, and have a loamy subsoil.

This unit is used as rangeland and as habitat for wetland wildlife.

The main limitations of this unit for livestock grazing are a seasonal high water table and a hazard of flooding.

This unit provides habitat for many species of duck and other waterfowl.

3. Lasauses Variant-Boulder Lake

Nearly level, poorly drained and somewhat poorly drained, very deep soils that have a clayey subsoil; on lakebeds

This map unit is in the northwestern part of the survey area. Slope is 0 to 1 percent. Elevation is about 5,670 feet. The average annual precipitation is about 15 inches, the average annual air temperature is about 44 degrees F, and the average frost-free period is 70 to 90 days.

This unit makes up about 1 percent of the survey area. It is about 75 percent Lasauses Variant soils and 25 percent Boulder Lake soils.

Lasauses Variant soils are in the center of intermittent lakebeds. These soils are very deep and poorly drained. They formed in lacustrine sediment derived from the surrounding basalt plateaus. The surface layer is medium textured. The subsoil and substratum are fine textured.

Boulder Lake soils are along the edges of intermittent lakebeds. These soils are very deep and somewhat poorly drained. They formed in lacustrine sediment derived from the surrounding basalt plateaus. These soils are fine textured throughout.

This unit is used as rangeland and as seasonal habitat for wetland wildlife.

The main limitation of this unit for livestock grazing is wetness in spring and early in summer.

Soils on alluvial terraces and piedmont slopes

One map unit is on this landscape position. It makes up about 17 percent of the survey area.

4. Thacker-Soonahbe-Paynecreek

Nearly level to rolling, well drained, moderately deep to very deep soils; on alluvial terraces and piedmont slopes

This map unit is in the central part of the survey area. Slope is 1 to 16 percent. Elevation ranges from 5,270 to 5,600 feet. The average annual precipitation is about 15 inches, the average annual air temperature is about 44 degrees F, and the average frost-free period is 80 to 100 days.

This unit makes up about 17 percent of the survey area. It is about 41 percent Thacker soils, 24 percent Soonahbe soils, and 17 percent Paynecreek soils. The remaining 18 percent is components of minor extent (fig. 2).

Thacker soils are on alluvial terraces and piedmont slopes. These soils are moderately deep and well drained. They formed in alluvium derived from mixed sources. The surface layer is medium textured and is gravelly in the lower part. The subsoil is fine textured. An indurated hardpan is at a depth of 21 inches. The substratum to a depth of 84 inches or more is gravelly to extremely gravelly and is coarse textured.

Soonahbe soils are on alluvial terraces and piedmont slopes. These soils are deep and well drained. They formed in loess and alluvium derived from mixed sources. The surface layer is medium textured. The subsoil is medium textured and moderately fine textured. The substratum, to a depth of 46 inches, is medium textured. An indurated hardpan is at a depth of 46 inches. Below the hardpan, the substratum is medium textured to a depth of 80 inches and it is gravelly and coarse textured to a depth of 84 inches or more.

Paynecreek soils are on alluvial terraces. These soils are very deep and well drained. They formed in alluvium derived from mixed sources. The surface layer is gravelly and is medium textured. The subsoil is gravelly and is medium textured, moderately fine textured, and moderately coarse textured. The substratum to a depth of 84 inches or more is very gravelly and is coarse textured.

Of minor extent in this unit are Simonton, Yatahoney, and Bluecreek soils.

This unit is used mainly as rangeland. It is also used for irrigated crops, homesites, and recreation.

This unit has only minor limitations for livestock grazing. The main limitations for irrigated crops are a hazard of erosion and the fine textured subsoil of the Thacker soils. The main limitations for homesite development are the depth to a hardpan and the high shrink-swell potential of the Thacker soils. The main limitations for recreational development are the very slow permeability and dustiness of the surface layer.

Some areas of this unit that support low sagebrush are used as sage grouse strutting grounds.

Soils on basalt and rhyolite tablelands and on high plateaus

Three map units are on these landscape positions. They make up about 54 percent of the survey area.

5. Deunah-Rubble land-Bulake

Nearly level to hilly, well drained, moderately deep and shallow soils that have a clayey subsoil, and Rubble land; on tablelands

This map unit is in the western part of the survey area. Slope is 1 to 25 percent. Elevation ranges from 5,400 to 6,000 feet. The average annual precipitation is about 14 inches, the average annual air temperature is about 44 degrees F, and the average frost-free period is 70 to 90 days.

This unit makes up about 30 percent of the survey area. It is about 40 percent Deunah soils, 15 percent Rubble land, and 10 percent Bulake soils. The remaining 35 percent is components of minor extent.

Deunah soils are on stable summits of basalt and rhyolite tablelands. These soils are moderately deep and well drained. They formed in old alluvial and eolian material derived from mixed sources. From 1 to 50 percent of the surface is covered with stones. The surface layer is stony or extremely stony and is medium textured. The subsoil is fine textured. An indurated hardpan is at a depth of 23 inches. Unweathered bedrock is at a depth of 28 inches.

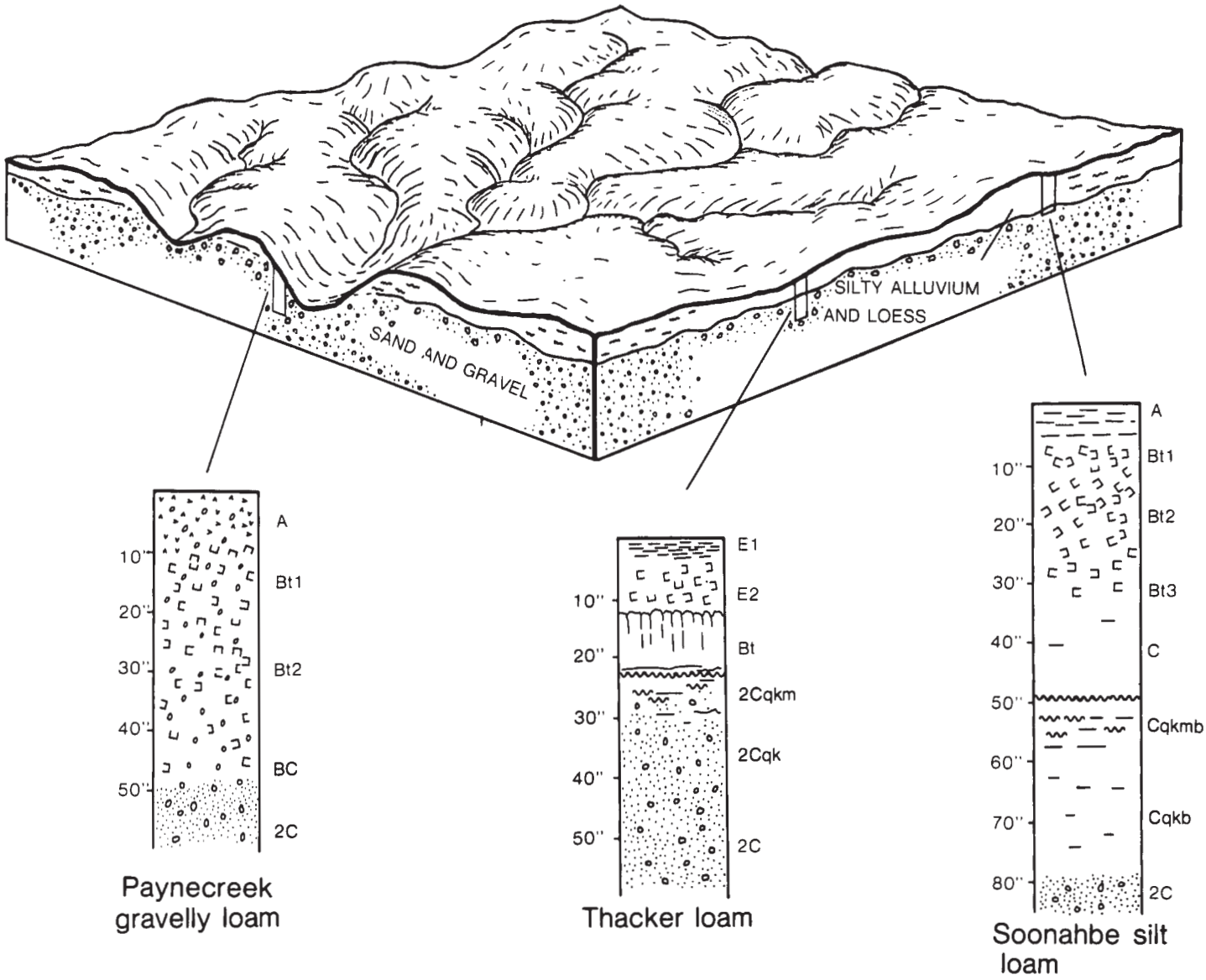


Figure 2.—Typical landscape and underlying material in an area of general soil map unit 4.

Rubble land is on side slopes and escarpments on tablelands. It consists of areas that are covered with stones and support little or no vegetation.

Bulake soils are on ridgetops and hilltops on tablelands. These soils are shallow and well drained. They formed in material weathered from rhyolite. From 1 to 3 percent of the surface is covered with stones. The surface layer is stony and medium textured. The subsoil is fine textured. Unweathered rhyolite is at a depth of 17 inches.

Of minor extent in this unit are Wickahoney soils, Haploxeralfs, and Wagonbox and Petan soils on rocky side slopes; Hatpeak soils on summits; and Yatahoney, Blackleg, Burmah Variant, and Torney soils on alluvial foot slopes and in basins.

This unit is used as rangeland and wildlife habitat.

The main limitations of this unit for livestock grazing are surface stoniness and wetness in spring.

Wildlife species in this unit include antelope, coyote, and sage grouse. Some areas that support low sagebrush are used as sage grouse strutting grounds.

6. Strickland-Bluebell

Undulating to hilly, well drained, moderately deep soils that have a loamy subsoil; on summits of high plateaus

This map unit is in the east-central part of the survey area. Slope is 2 to 20 percent. Elevation ranges from 6,500 to 7,800 feet. The average annual precipitation is about 20 inches, the average annual air temperature is about 40 degrees F, and the average frost-free period is 20 to 50 days.

This unit makes up about 9 percent of the survey area. It is about 37 percent Strickland soils and 32 percent Bluebell soils. The remaining 31 percent is components of minor extent.

Strickland soils are on back slopes and foot slopes. These soils are moderately deep and well drained. They formed in slope alluvium derived dominantly from basalt and tuff. The soils are medium textured. Tuff is at a depth of about 28 inches.

Bluebell soils are on hilltops and shoulder slopes. These soils are moderately deep and well drained. They formed in slope alluvium derived dominantly from basalt and tuff. The surface layer is medium textured. The subsoil is very stony and medium textured. Tuff is at a depth of 29 inches.

Of minor extent in this unit are Dranyon and Parkay soils on steep side slopes.

This unit is used as rangeland and wildlife habitat.

The main limitation of this unit for livestock grazing is wetness in spring.

This unit provides habitat for wildlife such as deer, beaver, and coyote.

7. Wickahoney-Wagonbox

Nearly level to hilly, well drained, shallow soils; on basalt tableland summits

This map unit is in the northeastern part of the survey area. Slope is 2 to 25 percent. Elevation ranges from 5,800 to 6,700 feet. The average annual precipitation is about 15 inches, the average annual air temperature is about 42 degrees F, and the average frost-free period is 50 to 80 days.

This unit makes up about 15 percent of the survey area. It is about 46 percent Wickahoney soils and 17 percent Wagonbox soils. The remaining 37 percent is components of minor extent.

Wickahoney soils are shallow and well drained. They formed in residuum derived from basalt. From 50 to 90 percent of the surface layer is covered with stones. The surface layer is rubbly and moderately fine textured. The subsoil is very stony and fine textured. Unweathered basalt is at a depth of about 16 inches.

Wagonbox soils are shallow and well drained. They formed in residuum derived dominantly from basalt. From 50 to 90 percent of the surface is covered with stones. The surface layer is rubbly and moderately fine textured. The subsoil is very stony and fine textured. An indurated hardpan is at a depth of about 17 inches. Unweathered basalt is at a depth of about 23 inches.

Of minor extent in this unit are Haploxeralfs, Durixeralfs, and Parkay soils on steep side slopes and Boulder Lake soils in drainageways.

This unit is used as rangeland.

The main limitation of this unit for livestock grazing is surface stoniness.

Soils on hills and mountains

Four map units are on these landscape positions. They make up about 18 percent of the survey area.

8. Cavanaugh-Sattley-Obray

Gently sloping to steep, well drained, moderately deep to very deep soils; on rhyolite and rhyolitic tuff hillsides

This map unit is in the south-central part of the survey area. Slope is 4 to 40 percent. Elevation ranges from 5,400 to 6,500 feet. The average annual precipitation is about 13 to 16 inches, the average annual air temperature is about 43 to 45 degrees F, and the average frost-free period is 70 to 90 days.

This unit makes up about 11 percent of the survey area. It is about 43 percent Cavanaugh soils, 31 percent Sattley soils, and 11 percent Obray soils. The remaining 15 percent is components of minor extent.

Cavanaugh soils are on convex hillsides. These soils are moderately deep and well drained. They formed in colluvium derived dominantly from rhyolite and rhyolitic tuff. From 3 to 15 percent of the surface is covered with stones. The surface layer is very stony and medium textured. The subsoil is cobbly and moderately fine textured in the upper part and very cobbly and fine textured in the lower part. Unweathered rhyolite is at a depth of 33 inches.

Sattley soils are on concave hillsides. These soils are deep and well drained. They formed in colluvium derived dominantly from rhyolite and rhyolitic tuff. The surface layer is gravelly in the upper part and very gravelly in the lower part. It is medium textured throughout. The subsoil is very gravelly and is moderately fine textured and medium textured. The substratum is extremely cobbly and medium textured. Unweathered rhyolitic tuff is at a depth of 41 inches.

Obray soils are on concave hillsides. These soils are very deep and well drained. They formed in slope alluvium derived dominantly from rhyolite and rhyolitic tuff. As much as 3 percent of the surface is covered with stones. The surface layer is fine textured throughout, and it is stony in the upper part. The subsoil is moderately fine textured.

Of minor extent in this unit are Wickahoney soils on summits.

This unit is used mainly as rangeland. It is also used as wildlife habitat.

This unit has only minor limitations for livestock grazing. Slope and stones on the surface limit the use of some management practices.

This unit provides habitat for wildlife such as deer and coyote.

9. Parkay-Dranyon-Cavanaugh

Moderately steep to very steep, well drained, deep and moderately deep soils that are cool in summer; on rhyolite and rhyolitic tuff hillsides and mountainsides

This map unit is in the southeastern part of the survey area. Slope is 15 to 50 percent. Elevation ranges from 6,200 to 7,600 feet. The average annual precipitation is about 16 to 22 inches, the average annual air temperature is about 41 to 43 degrees F, and the average frost-free period is 30 to 70 days.

This unit makes up about 3 percent of the survey area. It is about 35 percent Parkay soils, 25 percent Dranyon soils, and 20 percent Cavanaugh soils. The remaining 20 percent is components of minor extent.

Parkay soils are on north- and east-facing side slopes. These soils are deep and well drained. They formed in colluvium derived dominantly from rhyolite and rhyolitic tuff. As much as 1 percent of the surface is covered with stones. The surface layer is stony and medium textured in the upper part, and it is very cobbly and medium textured in the lower part. The subsoil is extremely cobbly and moderately fine textured. Unweathered rhyolitic tuff is at a depth of 45 inches.

Dranyon soils are on north- and east-facing side slopes. These soils are deep and well drained. They formed in colluvium derived dominantly from rhyolite and rhyolitic tuff. The surface layer is medium textured. The subsoil is medium textured and moderately fine textured in the upper part, and it is very cobbly and moderately fine textured in the lower part. Unweathered rhyolitic tuff is at a depth of 53 inches.

Cavanaugh soils are on south- and west-facing side slopes. These soils are moderately deep and well drained. They formed in colluvium derived dominantly from rhyolite and rhyolitic tuff. From 3 to 15 percent of the surface is covered with stones. The surface layer is very stony and medium textured. The subsoil is cobbly and moderately fine textured in the upper part, and it is very cobbly and fine textured in the lower part. Unweathered rhyolite is at a depth of 33 inches.

Of minor extent in this unit are Searla and Povey soils on mountains.

This unit is used mainly as rangeland. It is also used for wildlife habitat.

The main limitation of this unit for livestock grazing is steepness of slope.

This unit provides habitat for wildlife such as deer and coyote.

10. Moonstone-Earcree-Watchabob

Sloping to steep, well drained, moderately deep and very deep soils; on granite hillsides and mountainsides

This map unit is in the southeastern part of the survey area. Slope is 10 to 45 percent. Elevation ranges from 5,600 to 6,900 feet. The average annual precipitation is about 13 to 20 inches, the average annual air temperature is about 39 to 45 degrees F, and the average frost-free period is 30 to 90 days.

This unit makes up about 2 percent of the survey area. It is about 36 percent Moonstone soils, 29 percent Earcree soils, and 22 percent Watchabob soils. The remaining 13 percent is components of minor extent.

Moonstone soils are on hillsides and mountainsides. These soils are moderately deep and well drained. They formed in colluvium and residuum derived dominantly from granite. The soils are gravelly and moderately coarse textured throughout. Weathered granite is at a depth of 28 inches.

Earcree soils are on north- and east-facing hillsides and mountainsides. These soils are very deep and well drained. They formed in colluvium derived dominantly from granite. The surface layer is moderately coarse textured throughout, and it is gravelly in the upper part. The underlying material is gravelly and coarse textured to a depth of 60 inches or more.

Watchabob soils are on hillsides. These soils are moderately deep and well drained. They formed in colluvium derived dominantly from granite. The surface layer and the upper part of the subsoil are moderately coarse textured and gravelly. The lower part of the subsoil is gravelly and medium textured. The substratum is extremely gravelly and coarse textured. Unweathered granite is at a depth of 28 inches.

Of minor extent in this unit are Bearskin Variant soils on summits.

This unit is used mainly as rangeland. It is also used for wildlife habitat.

The main limitations of this unit for livestock grazing are a hazard of erosion and steepness of slope.

This unit provides habitat for wildlife such as deer and coyote.

11. Soonahbe Variant-Bulake

Nearly level to rolling, well drained, moderately deep and shallow soils; on rhyolitic tuff hillsides

This map unit is in the southwestern part of the survey area. Slope is 2 to 15 percent. Elevation ranges from 5,280 to 5,500 feet. The average annual precipitation is about 13 to 16 inches, the average annual air temperature is about 43 to 45 degrees F, and the average frost-free period is 70 to 100 days.

This unit makes up about 2 percent of the survey area. It is about 45 percent Soonahbe Variant soils and 35

percent Bulake soils. The remaining 20 percent is components of minor extent.

Soonahbe Variant soils are on hillsides. These soils are moderately deep and well drained. They formed in material derived dominantly from rhyolitic tuff influenced by mixed alluvium. The surface layer is moderately coarse textured in the upper part and medium textured in the lower part. The subsoil is medium textured in the upper part, and it is gravelly and moderately coarse textured in the lower part. Unweathered rhyolitic tuff is at a depth of 28 inches.

Bulake soils are on hillsides. These soils are shallow and well drained. They formed in material derived dominantly from rhyolitic tuff. The upper part of the surface layer is moderately coarse textured. The lower part of the surface layer and the upper part of the subsoil are medium textured. The lower part of the subsoil is fine textured. The substratum is rhyolitic tuff underlain by unweathered tuff at a depth of 20 inches.

Of minor extent in this unit are Paynecreek soils and areas of Rock outcrop.

This unit is used mainly as rangeland. It is also used for recreation.

This unit has only minor limitations for livestock grazing. Plant growth is limited on the Bulake soils because of droughtiness. The main limitation of this unit for recreational development is depth to bedrock.

Broad Land Use Considerations

The soils of the Duck Valley Indian Reservation are used mainly as rangeland and irrigated cropland. The survey area includes about 275,800 acres of rangeland and native pastureland and 12,000 acres of irrigated cropland. Sprinkler irrigation is used on about 2,000 acres. The amount of land developed for urban uses is not extensive. About 1,200 acres is used for urban land, farmsteads, and roads.

The major land use trend is conversion of rangeland to irrigated cropland. Most of the cropland development is taking place in areas of general map unit 4. The overall potential for future development of irrigated cropland depends on the availability of irrigation water and the availability of energy to operate irrigation systems.

Important areas of irrigated cropland are in units 1 and 4. Most of the cropland in unit 1 is surface irrigated. The types of crops that can be grown on this unit are limited by a seasonal high water table and a hazard of flooding. Most of the cropland in unit 4 is sprinkler irrigated. Areas of this unit now used as rangeland have good potential for use as irrigated cropland. Both units 1 and 4 have areas with potential for production of nonirrigated crops such as winter wheat.

A few areas of unit 2 have potential for use as irrigated or nonirrigated cropland; however, most areas of this unit are very poorly suited to this use because of wetness and a hazard of flooding. Units 3, 5, 6, 7, 8, 9, 10, and 11 have limitations such as stoniness, steepness of slope, and a hazard of flooding that make them very poorly suited to use as cropland.

Rangeland is used mainly for livestock grazing and wildlife habitat. Most areas are well suited to grazing by livestock. Units 1, 2, 3, 4, 6, 8, and 11 have few limitations for livestock grazing except for seasonal wetness. Livestock grazing and use of some rangeland management practices are limited by stones on the surface and steepness of slope in some areas of units 5, 7, 9, and 10.

The rangeland provides habitat for many different species of wildlife. Antelope, coyote, and sage grouse and other upland game birds inhabit rangeland in the valleys and on the western and northeastern plateaus. Units 6, 8, 9, and 10 include areas that provide good habitat for deer, coyote, and some beaver. Wetland areas in units 1 and 2 provide important habitat for ducks and other types of waterfowl.

Areas of urban land are mainly in units 1 and 4. A seasonal high water table is a limitation in most areas of unit 1. A hazard of flooding is also a limitation in some areas. Depth to a hardpan and a clayey subsoil are limitations in unit 4. With the exception of a few small areas, the other general map units in the survey area are poorly suited to most urban land uses. The general soil map can help in the planning of urban areas but not in selecting sites for specific urban structures.

Campgrounds and picnic areas have been developed in units 4 and 11 near Sheep Creek and Mountain View Reservoirs. Depth to bedrock or to a hardpan and a clayey subsoil limit further recreational development in these areas. The potential for recreational development in units 1, 2, and 3 is limited mainly by wetness and a hazard of flooding. Map units 6, 7, 8, 9, and 10 have low potential for most types of recreational development because of limitations such as stones on the surface, steepness of slope, and shallow depth.

Detailed Soil Map Units

The map units delineated on the detailed maps at the back of this survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions in this section, along with the maps, can be used to determine the suitability and potential of a unit for specific uses. They also can be used to plan the management needed for those uses. More information on each map unit is given under "Use and Management of the Soils."

A map unit delineation on a map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils or miscellaneous areas. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils and miscellaneous areas are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some "included" areas that belong to other taxonomic classes.

Most included soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, inclusions. They may or may not be mentioned in the map unit description. Other included soils and miscellaneous areas, however, have properties and behavior divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, inclusions. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. The included areas of contrasting soils or miscellaneous areas are mentioned in the map unit descriptions. A few included areas may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of included areas in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into segments that have similar use and management requirements. The delineation of such landscape segments on the map provides sufficient information for the development of resource plans, but if intensive use of small areas is planned, onsite investigation to precisely define and locate the soils and miscellaneous areas is needed.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives the principal hazards and limitations to be considered in planning for specific uses.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer or of the underlying layers, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer or of the underlying layers. They also can differ in slope, stoniness, salinity, wetness, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Tucker silty clay loam, gravelly substratum, 0 to 2 percent slopes, is one of several phases in the Tucker series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes or soil associations.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Thacker-Simonton complex, 4 to 10 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary

to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Searla-Povey association, 30 to 60 percent slopes, is an example.

This survey includes *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rubble land is an example.

The soils in this survey area were mapped at two levels of intensity. The arable land, about 27 percent of the survey area, was mapped at a detailed level, which is suitable for agricultural planning and for determining potentially irrigable land. In addition, the arable soils were investigated to a depth of 84 inches, rather than to the standard depth of 60 inches. The nonarable land was mapped at a less detailed level, but one suitable for rangeland planning.

Soil mapping of this survey adjoins and matches mapping of the surveys of Owyhee County Area, Idaho, and Northwest Elko County Area, Nevada.

Table 4 gives the acreage and proportionate extent of each map unit. Other tables (see "Summary of Tables") give properties of the soils and the limitations, capabilities, and potentials for many uses. The Glossary defines many of the terms used in describing the soils or miscellaneous areas.

Map Unit Descriptions

1—Bedstead-Arbidge association, 2 to 15 percent slopes. This map unit is on plateaus mantled with alluvium. Elevation is 5,220 to 5,350 feet. The average annual precipitation is about 13 inches, the average annual air temperature is about 45 degrees F, and the average frost-free period is 80 to 95 days.

This unit is about 45 percent Bedstead extremely stony silt loam, 2 to 15 percent slopes, on ridges and in rim areas and 35 percent Arbidge silt loam, 2 to 8 percent slopes, on mounds and in areas of alluvial deposits.

Included in this unit are small areas of a soil that is similar to the Arbidge soil but is very gravelly in the subsoil and does not have a hardpan and small areas of a soil that is similar to the Arbidge soil but is shallow to bedrock.

The Bedstead soil is moderately deep and well drained. It formed in material derived dominantly from basalt. Typically, 10 to 60 percent of the surface is covered with stones and cobbles. The surface layer is pale brown extremely stony silt loam 11 inches thick. The upper 7 inches of the subsoil is brown extremely stony clay, and the lower 3 inches is brown extremely stony clay loam. Below this is a white, indurated hardpan about 1 inch thick. Basalt is at a depth of 22 inches.

Permeability of the Bedstead soil is slow. Available water capacity is low. Effective rooting depth is 21 to 36 inches. Runoff is medium, and the hazard of water erosion is slight.

The Arbidge soil is moderately deep and well drained. It formed in alluvium derived dominantly from basalt and rhyolite. Typically, the surface layer is grayish brown silt loam 3 inches thick. The upper 16 inches of the subsoil is brown and pale brown clay loam, the next 6 inches is light yellowish brown gravelly loam, and the lower part to a depth of 30 inches is pale brown gravelly sandy loam. Below this is a very pale brown, indurated hardpan about 8 inches thick over sand and gravel.

Permeability of the Arbidge soil is moderately slow. Available water capacity is moderate. Effective rooting depth is 20 to 40 inches. Runoff is medium, and the hazard of water erosion is moderate.

This unit is used for livestock grazing.

The potential plant community on the Bedstead soil is mainly low sagebrush and bluebunch wheatgrass. The potential plant community on the Arbidge soil is mainly Wyoming big sagebrush and bluebunch wheatgrass. If the potential plant community deteriorates, less preferred forage plants increase. Among the plants that increase are Wyoming big sagebrush, low sagebrush, bottlebrush squirreltail, and phlox.

This unit is suited to livestock grazing in spring. The main limitations are scarcity of water for livestock and very limited access to the unit. The Arbidge soil has few limitations for rangeland seeding and brush control. The main limitation of the Bedstead soil for rangeland seeding and brush control is stoniness.

The Bedstead soil is in capability subclass VIIs, nonirrigated, and the Arbidge soil is in capability subclass VIe, nonirrigated.

2—Blackfoot, frequently flooded-Tucker, gravelly substratum complex, 0 to 2 percent slopes. This map unit is on flood plains of the Owyhee River. Elevation is 5,300 to 5,325 feet. The average annual precipitation is about 15 inches, the average annual air temperature is about 44 degrees F, and the average frost-free period is 80 to 100 days.

This unit is about 35 percent Blackfoot silt loam, frequently flooded, and 35 percent Tucker silty clay loam, gravelly substratum. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Included in this unit are small areas of soils that are similar to the Blackfoot and Tucker soils but have sand and gravel at a depth of less than 40 inches, soils that are very poorly drained and are in concave areas and drainageways, and Zola loam in slightly higher, convex areas. Also included are small areas of Disabel Variant silt loam, deposits of sand and gravel, and soils in old stream channels that are scattered throughout the unit.

The Blackfoot soil is very deep and somewhat poorly drained. It formed in alluvium derived from mixed sources. Typically, the upper 7 inches of the surface layer is grayish brown silt loam and the lower 6 inches is grayish brown loam. The upper 7 inches of the subsoil is

light brownish gray loam. Below this is a buried surface layer of grayish brown loam 7 inches thick. The lower part of the buried subsoil is light gray loam 7 inches thick. Below this to a depth of 45 inches is a buried surface layer of dark gray silty clay loam. The upper 20 inches of the substratum is pale yellow clay loam, and the lower part to a depth of 84 inches or more is variegated extremely gravelly coarse sand.

Permeability of the Blackfoot soil is moderately slow. Available water capacity is very high. Effective rooting depth is limited by a seasonal high water table that is at a depth of 1.5 to 3.0 feet from March through June. This soil is subject to frequent, long periods of flooding in March through May. Runoff is slow, and the hazard of water erosion is slight.

The Tucker soil is very deep and somewhat poorly drained. It formed in alluvium derived from mixed sources. Typically, the upper 2 inches of the surface layer is light brownish gray silt loam and the lower 11 inches is gray silty clay. The upper 9 inches of the subsoil is gray silty clay, the next 16 inches is white clay loam, and the lower part to a depth of 46 inches is light gray loam. The substratum to a depth of 84 inches or more is strata of gravelly coarse sand to very gravelly sand.

Permeability of the Tucker soil is slow to a depth of 46 inches and very rapid below this depth. Available water capacity is very high. Effective rooting depth is limited by a seasonal high water table that is at a depth of 1.5 to 3.0 feet from March through June. This soil is subject to frequent, long periods of flooding in March through May. Runoff is slow, and the hazard of water erosion is slight.

This unit is used for production of hay and pasture.

This unit is suited to irrigated hay and pasture. It is limited mainly by wetness in spring and early in summer. Wetness limits the choice of plants and the period of cutting and grazing. Grazing should be delayed until the soil has drained sufficiently and is firm enough to withstand trampling by livestock. The seasonal high water table generally limits the suitability of this unit for deep-rooted crops. Subsurface drainage can be used to lower the water table if a suitable outlet is available.

After the water table is lowered, irrigation is needed for maximum production of hay and pasture. Border, corrugation, and sprinkler irrigation systems are suited to this unit. Irrigation water needs to be applied carefully to prevent the buildup of a high water table. Drainage may also be needed. Because of the slow permeability of the Tucker soil, applications of irrigation water should be adjusted to permit adequate infiltration. For the efficient application and distribution of surface irrigation water, leveling may be needed.

This map unit is in capability subclass Vw, irrigated and nonirrigated.

3—Bluecreek-Thacker, dry complex, 1 to 4 percent slopes. This map unit is on stream terraces. Elevation is 5,300 to 5,330 feet. The average annual precipitation is about 15 inches, the average annual air temperature is about 44 degrees F, and the average frost-free period is 80 to 100 days.

This unit is about 55 percent Bluecreek sandy loam on ridges and the upper side slopes and 30 percent Thacker loam, dry, on the lower side slopes and in draws. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Included in this unit are small areas of Simonton sandy loam and Paynecreek Variant loam on ridgetops and Disabel Variant silt loam in drainageways. Also included are small areas of soils that have slopes of 4 to 8 percent.

The Bluecreek soil is moderately deep and well drained. It formed in alluvium derived dominantly from rhyolite and basalt. Typically, the surface layer is pale brown sandy loam 6 inches thick. The upper 5 inches of the subsoil is pale brown sandy loam, the next 9 inches is light yellowish brown clay loam, and the lower part to a depth of 26 inches is pale brown gravelly sandy loam. The next layer is a grayish brown, indurated hardpan 3 inches thick. The upper 10 inches of the substratum is gray very gravelly sand, the next 5 inches is a grayish brown, indurated hardpan, and the lower part to a depth of 84 inches or more is gray very gravelly sand.

Permeability of the Bluecreek soil is slow. Available water capacity is low. Effective rooting depth is 20 to 40 inches. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing is high.

The Thacker soil is moderately deep and well drained. It formed in alluvium derived from mixed sources. Typically, the upper 4 inches of the surface layer is pale brown loam and the lower 8 inches is pale brown gravelly loam. The subsoil is dark yellowish brown clay 9 inches thick. A light yellowish brown, indurated hardpan is at a depth of 21 inches. The upper 13 inches of the substratum is light yellowish brown, slightly cemented extremely gravelly sand, and the lower part to a depth of 84 inches or more is strata of gravelly sand and sand.

Permeability of the Thacker soil is very slow. Available water capacity is low to moderate. Effective rooting depth is 20 to 40 inches, but penetration and distribution of roots are limited by the claypan above that depth. Runoff is rapid, and the hazard of water erosion is moderate. Water is perched above the very slowly permeable subsoil during rainy periods in spring.

This unit is used for livestock grazing.

The potential plant community on the Bluecreek soil is mainly basin big sagebrush, Idaho fescue, and bluebunch wheatgrass. The potential plant community on the Thacker soil is mainly stunted basin big sagebrush, Idaho fescue, and bluebunch wheatgrass. If the range deteriorates, Idaho fescue and bluebunch wheatgrass decrease and are gradually replaced by less desirable annual and perennial grasses such as cheatgrass and

bottlebrush squirreltail. Basin big sagebrush and rabbitbrush generally increase.

This unit is suited to livestock grazing in spring and fall. It has only minor limitations. Availability of water for livestock may be a concern in fall.

This unit is poorly suited to irrigated cultivated crops. It is limited mainly by the claypan in the Thacker soil. The claypan restricts the growth of roots and the movement of water through the profile. Subsoiling opens up this claypan and allows water and roots to pass through. Moldboard plowing may bring the claypan to the surface; therefore, field preparations such as subsoiling and disking are better suited to this unit. Soil blowing can be controlled by keeping the soil rough and cloddy when it is not protected by vegetation.

Sprinkler irrigation is a suitable method of applying water. Because of the very slow permeability of the Thacker soil, applications of irrigation water should be light and frequent.

This map unit is in capability subclass IVe, irrigated and nonirrigated.

4—Bluecreek Variant-Paynecreek Variant complex, 0 to 4 percent slopes. This map unit is on flood plains and terrace remnants. Elevation is 5,300 to 5,310 feet. The average annual precipitation is about 15 inches, the average annual air temperature is about 44 degrees F, and the average frost-free period is 80 to 100 days.

This unit is about 40 percent Bluecreek Variant silt loam, 0 to 2 percent slopes, in the lower, generally concave areas and in drainageways and 40 percent Paynecreek Variant loam on low terrace remnants and in convex areas. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Included in this unit are small areas of Simonton sandy loam and Bluecreek sandy loam on higher terrace remnants. Also included are scattered small deposits of sand and gravel in stream channels, small areas of Disabel Variant silt loam, and small areas of soils that have slopes of 4 to 6 percent.

The Bluecreek Variant soil is very deep and moderately well drained. It formed in alluvium derived from mixed sources. Typically, the surface layer is light gray silt loam 7 inches thick. The upper 5 inches of the subsoil is gray clay, and the lower 9 inches is pale brown clay loam. The substratum to a depth of 90 inches or more stratified, variegated gravelly sand and extremely gravelly sand.

Permeability of the Bluecreek Variant soil is slow to a depth of 21 inches and very rapid below this depth. Available water capacity is high. Effective rooting depth is limited by a seasonal high water table that is at a depth of 3 to 5 feet from March through June. This soil is subject to frequent, long periods of flooding in March through June. Runoff is slow, and the hazard of water erosion is slight. Water is perched above the slowly permeable subsoil during floods and rainy periods.

The Paynecreek Variant soil is very deep and well drained. It formed in alluvium derived from mixed sources. Typically, the surface layer is grayish brown loam 12 inches thick. The subsurface layer is pale brown sandy loam 5 inches thick. The upper 5 inches of the subsoil is pale brown loam, and the lower 13 inches is light yellowish brown loam. The substratum to a depth of 84 inches or more is variegated very gravelly sand.

Permeability of the Paynecreek Variant soil is moderately slow to a depth of 35 inches and very rapid below this depth. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is slow, and the hazard of water erosion is slight.

This unit is used for livestock grazing.

The potential plant community on the Bluecreek Variant soil is mainly silver sagebrush and slender wheatgrass. The potential plant community on the Paynecreek Variant soil is mainly basin big sagebrush, Idaho fescue, and bluebunch wheatgrass. If the range deteriorates, slender wheatgrass and Idaho fescue decrease and are gradually replaced by bottlebrush squirreltail and bluegrass. Both species of sagebrush generally increase.

This unit is suited to livestock grazing in spring and fall. The main limitation is wetness of the Bluecreek Variant soil in spring and early in summer. Grazing should be delayed until the soil has drained sufficiently and is firm enough to withstand trampling by livestock. If chemical brush control is used in areas subject to flooding, care should be taken to avoid contaminating streams. Rate and time of application are important considerations.

This unit is suited to irrigated hay and is poorly suited to irrigated cultivated crops. It is limited mainly by wetness of the Bluecreek Variant soil in spring and early in summer.

This map unit is in capability subclass VIw, irrigated and nonirrigated.

5—Boulder Lake-Tucker, gravelly substratum complex, 0 to 1 percent slopes. This map unit is on flood plains of Blue Creek. Elevation is 5,300 to 5,310 feet. The average annual precipitation is about 15 inches, the average annual air temperature is about 44 degrees F, and the average frost-free period is 80 to 100 days.

This unit is about 65 percent Boulder Lake clay and 25 percent Tucker silty clay loam, gravelly substratum. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Included in this unit are small areas of Tucker Variant silt loam, Bluecreek Variant silt loam, and Disabel Variant silt loam scattered throughout the unit. Also included are

small areas of soils that are similar to the Tucker soil but are poorly drained and are in depressional areas.

The Boulder Lake soil is very deep and somewhat poorly drained. It formed in clayey alluvium derived from mixed sources. Typically, the surface layer is gray and grayish brown clay 26 inches thick. The subsoil is light brownish gray, calcareous clay 36 inches thick. The substratum to a depth of 84 inches or more is light brownish gray, calcareous clay.

Permeability of the Boulder Lake soil is very slow. Available water capacity is very high. Effective rooting depth is limited by a seasonal high water table that is at a depth of 1.5 to 3.0 feet from March through June. This soil is subject to frequent, long periods of flooding in March through June. Runoff is slow, and the hazard of water erosion is slight.

The Tucker soil is very deep and somewhat poorly drained. It formed in alluvium derived from mixed sources. Typically, the upper 2 inches of the surface layer is light brownish gray silt loam and the lower 11 inches is gray silty clay. The upper 9 inches of the subsoil is gray silty clay, the next 16 inches is white clay loam, and the lower part to a depth of 46 inches is light gray loam. The substratum to a depth of 84 inches or more is strata of gravelly coarse sand to very gravelly sand.

Permeability of the Tucker soil is slow to a depth of 46 inches and very rapid below this depth. Available water capacity is very high. Effective rooting depth is limited by a seasonal high water table that is at a depth of 1.5 to 3.0 feet from March through June. This soil is subject to frequent, long periods of flooding in March through May. Runoff is slow, and the hazard of water erosion is slight.

This unit is used for livestock grazing.

The potential plant community on the Boulder Lake soil is mainly silver sagebrush and bluegrass. The potential plant community on the Tucker soil is mainly tufted hairgrass, slender wheatgrass, sedges, rushes, and other meadow plants. If the range deteriorates, tufted hairgrass, slender wheatgrass, bluegrass, and sedges decrease and are gradually replaced by less desirable forage plants. Silver sagebrush, rushes, thistles, and Rocky Mountain iris generally increase.

This unit is suited to livestock grazing in summer and fall. The main limitation is wetness in spring and early in summer. Grazing should be delayed until the soil has drained sufficiently and is firm enough to withstand trampling by livestock. Limitations for mechanical seeding and brush control are moderate during rainy periods and when the water table is high. If chemical brush control is used in areas subject to flooding, care should be taken to avoid contaminating streams. Rate and time of application are important considerations.

This unit provides wetland habitat for several species of waterfowl.

This unit is poorly suited to irrigated hay and is very poorly suited to irrigated cultivated crops. The main limitations are wetness in spring and early in summer and the very slow permeability of the Boulder Lake soil.

This map unit is in capability subclass VIw, irrigated and nonirrigated.

6—Bulake-Deunah complex, 2 to 25 percent slopes. This map unit is on mesas and hillsides. Elevation is 5,400 to 5,700 feet. The average annual precipitation is about 14 inches, the average annual air temperature is about 44 degrees F, and the average frost-free period is 70 to 90 days.

This unit is about 50 percent Bulake stony loam, 2 to 25 percent slopes, on ridgetops, hilltops, and convex side slopes and 30 percent Deunah extremely stony loam, 2 to 10 percent slopes, in concave areas. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Included in this unit are small areas of Yatahoney loam and Soonahbe silt loam in drainageways between hills, Rock outcrop on ridges and hilltops, and Rubble land that is near areas of Rock outcrop and is scattered throughout the unit.

The Bulake soil is shallow and well drained. It formed in material derived dominantly from rhyolite. Typically, as much as 3 percent of the surface is covered with stones. The upper 4 inches of the surface layer is pale brown stony loam, and the lower 4 inches is pale brown gravelly loam. The subsoil is strong brown clay 9 inches thick. Rhyolite is at a depth of 17 inches.

Permeability of the Bulake soil is slow. Available water capacity is very low. Effective rooting depth is 14 to 20 inches. Runoff is very rapid, and the hazard of water erosion is very high.

The Deunah soil is moderately deep and well drained. It formed in old alluvial and eolian material derived from mixed sources. Typically, 15 to 50 percent of the surface is covered with stones. The surface layer is light brownish gray extremely stony loam 9 inches thick. The upper 5 inches of the subsoil is brown cobbly clay loam, and the lower 6 inches is brown clay. A very pale brown, cemented hardpan is at a depth of 20 inches. Fractured rhyolite is at a depth of 26 inches.

Permeability of the Deunah soil is very slow. Available water capacity is moderate. Effective rooting depth is 22 to 32 inches, but penetration and distribution of roots are limited by the claypan above that depth. Runoff is rapid, and the hazard of water erosion is high. Water is perched above the very slowly permeable subsoil during rainy periods in spring.

This unit is used for livestock grazing.

The potential plant community on the Bulake soil is mainly low sagebrush and Idaho fescue. The potential plant community on the Deunah soil is mainly alkali sagebrush and Idaho fescue. If the potential plant community deteriorates, less preferred forage plants

increase. Among the plants that increase are sagebrush, phlox, lupine, and bottlebrush squirreltail.

This unit is suited to livestock grazing in spring and summer. The main limitations are the droughtiness of the Bulake soil and the stoniness and wetness of the Deunah soil. Plant growth on the Bulake soil is limited mainly by the very low available water capacity. The Deunah soil is shallow to a claypan. In spring the claypan swells upon wetting and restricts the downward movement of water. The surface then becomes saturated, and the soil is particularly susceptible to trampling and soil compaction. Compaction generally reduces the water intake rate, increases erosion, and ultimately reduces the productivity of the soil. Grazing should be delayed until the soil has drained sufficiently and is firm enough to withstand trampling by livestock. Large stones on the surface of the Deunah soil limit movement of livestock and limit mechanical seeding.

This map unit is in capability subclass VIIs.

7—Burmah Variant-Torney Variant-Yatahoney complex, 0 to 2 percent slopes. This map unit is in basins and drainageways on tablelands. Elevation is 5,500 to 5,800 feet. The average annual precipitation is about 15 inches, the average annual air temperature is about 44 degrees F, and the average frost-free period is 70 to 90 days.

This unit is about 40 percent Burmah Variant silt loam on basin floors, 20 percent Torney Variant silt loam, 0 to 2 percent slopes, on basin floors, and 20 percent Yatahoney very cobbly loam, 1 to 2 percent slopes, on adjacent toe slopes. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Included in this unit are small areas of Boulder Lake clay in depressional areas and a soil that is similar to the Yatahoney soil but is shallow to a hardpan and is on toe slopes.

The Burmah Variant soil is very deep and well drained. It formed in alluvium, dominantly from the surrounding tablelands. Typically, the surface layer is light gray silt loam 12 inches thick. The upper 28 inches of the subsoil is pale brown clay, and the lower 15 inches is light yellowish brown clay loam. The substratum to a depth of 60 inches or more is light yellowish brown clay loam.

Permeability of the Burmah Variant soil is very slow. Available water capacity is very high. Effective rooting depth is more than 60 inches, but penetration and distribution of roots are limited by the claypan above that depth. Runoff is slow, and the hazard of water erosion is slight. Water is perched above the very slowly permeable subsoil in spring.

The Torney Variant soil is very deep and well drained. It formed in alluvium, dominantly from the surrounding tablelands. Typically, the surface layer is brown silt loam 13 inches thick. The upper 4 inches of the subsoil is pale brown silty clay loam, and the lower 31 inches is light yellowish brown clay and silty clay loam. The substratum to a depth of 60 inches or more is very pale brown silt loam.

Permeability of the Torney Variant soil is slow. Available water capacity is very high. Effective rooting depth is 60 inches or more. Runoff is slow, and the hazard of water erosion is slight. Water is perched above the slowly permeable subsoil in spring.

The Yatahoney soil is moderately deep to a hardpan and is well drained. It formed in alluvium, dominantly from the surrounding tablelands. Typically, 35 to 50 percent of the surface is covered with cobbles. The surface layer is pale brown very cobbly loam 4 inches thick. The subsoil is brown and yellowish brown clay 16 inches thick. A very pale brown, cemented hardpan is at a depth of 20 inches. Basalt is at a depth of 40 inches.

Permeability of the Yatahoney soil is slow. Available water capacity is low. Effective rooting depth is 20 to 38 inches, but penetration and distribution of roots are limited by the claypan above that depth. Runoff is slow, and the hazard of water erosion is slight. Water is perched above the slowly permeable subsoil in spring.

This unit is used for livestock grazing.

The potential plant community on the Burmah Variant and Yatahoney soils is mainly alkali sagebrush and Idaho fescue. The potential plant community on the Torney Variant soil is mainly basin big sagebrush and Idaho fescue. If the potential plant community deteriorates, less preferred forage plants increase. Among the plants that increase are sagebrush, rabbitbrush, bottlebrush squirreltail, and phlox.

This unit is suited to livestock grazing in spring. The main limitations are the wetness of the Burmah Variant and Yatahoney soils in spring and the cobbles on the Yatahoney soil. The Burmah Variant and Yatahoney soils are shallow to a claypan. In spring the claypan swells upon wetting and restricts the downward movement of water. The surface then becomes saturated, and the soils are particularly susceptible to trampling and soil compaction. Compaction generally reduces the water intake rate, increases erosion, and ultimately reduces the productivity of the soils. Grazing should be delayed until the soils have drained sufficiently and are firm enough to withstand trampling by livestock. Large stones on the surface of the Yatahoney soil limit movement of livestock and limit mechanical seeding. The natural drainageways characteristic of this unit provide excellent opportunities for developing livestock water reservoirs.

This map unit is in capability subclass Vs.

8—Cavanaugh-Obray association, 4 to 30 percent slopes. This map unit is on hillsides. Elevation is 5,400 to 6,300 feet. The average annual precipitation is 13 to 17 inches, the average annual air temperature is 43 to 45 degrees F, and the average frost-free period is 70 to 90 days.

This unit is about 40 percent Cavanaugh very stony loam, 15 to 30 percent slopes, in convex areas and 40 percent Obray stony clay, 4 to 20 percent slopes, in concave areas.

Included in this unit are small areas of a soil that is similar to the Cavanaugh soil but is shallow and is on ridges and hilltops, Rock outcrop on ridges and hilltops, Paynecreek soils and soils that have slopes of less than 4 percent on alluvial terraces between hills, and soils that are extremely stony at the surface.

The Cavanaugh soil is moderately deep and well drained. It formed in colluvium derived dominantly from rhyolite and rhyolitic tuff. Typically, 3 to 15 percent of the surface is covered with stones. The surface layer is grayish brown very stony loam 5 inches thick. The upper 16 inches of the subsoil is grayish brown and brown cobbly clay loam, and the lower 11 inches is light yellowish brown very cobbly clay. Rhyolite is at a depth of 32 inches.

Permeability of the Cavanaugh soil is slow. Available water capacity is moderate. Effective rooting depth is 20 to 40 inches, but penetration and distribution of roots are limited by the claypan above that depth. Runoff is very rapid, and the hazard of water erosion is very high.

The Obray soil is very deep and well drained. It formed in slope alluvium derived dominantly from rhyolite and rhyolitic tuff. Typically, as much as 3 percent of the surface is covered with stones. The upper 4 inches of the surface layer is dark grayish brown stony clay, and the lower 31 inches is dark grayish brown clay. The subsoil is pale brown clay loam 13 inches thick. The upper 8 inches of the substratum is light yellowish brown clay loam, and the lower part to a depth of 60 inches or more is very pale brown clay loam.

Permeability of the Obray soil is very slow. Available water capacity is very high. Effective rooting depth is 60 inches or more. Runoff is very rapid, and the hazard of water erosion is high. The hazard of soil blowing is moderate.

This unit is used for livestock grazing. It is best suited to grazing in summer.

The potential plant community on the Cavanaugh soil is mainly low sagebrush and Idaho fescue. If the potential plant community deteriorates, less preferred forage plants increase. Among the plants that increase are sagebrush, phlox, and lupine. The Cavanaugh soil has few limitations for livestock grazing. Large stones on the surface of this soil limit mechanical seeding.

The potential plant community on the Obray soil is mainly low sagebrush, muleseardock, and Idaho fescue. If the potential plant community deteriorates, less preferred forage plants increase. Among the plants that increase are sagebrush, muleseardock, and bottlebrush squirreltail. The main limitation of the Obray soil for livestock grazing is wetness early in summer. Grazing should be delayed until the soil has drained sufficiently and is firm enough to withstand trampling by livestock. The Obray soil is in seepage areas that commonly provide good opportunities for development of springs.

The Cavanaugh soil is in capability subclass VIs, nonirrigated, and the Obray soil is in capability subclass IIIe, nonirrigated.

9—Cavanaugh-Sattley association, 15 to 40 percent slopes. This map unit is on hillsides. Elevation is 5,400 to 6,500 feet. The average annual precipitation is 13 to 16 inches, the average annual air temperature is 43 to 45 degrees F, and the average frost-free period is 70 to 90 days.

This unit is about 40 percent Cavanaugh very stony loam, 15 to 40 percent slopes, in convex areas and 40 percent Sattley gravelly loam, 15 to 40 percent slopes, dominantly in concave areas and on north- and east-facing side slopes.

Included in this unit are small areas of a soil that is similar to the Cavanaugh soil but has bedrock at a depth of 20 inches, Rock outcrop on ridges and hilltops, and soils that are extremely stony at the surface. Also included are small areas of Obray stony clay on concave side slopes.

The Cavanaugh soil is moderately deep and well drained. It formed in colluvium derived dominantly from rhyolite and rhyolitic tuff. Typically, 3 to 15 percent of the surface is covered with stones. The surface layer is grayish brown very stony loam 5 inches thick. The upper 16 inches of the subsoil is grayish brown and brown cobbly clay loam, and the lower 11 inches is light yellowish brown very cobbly clay. Rhyolite is at a depth of 32 inches.

Permeability of the Cavanaugh soil is slow. Available water capacity is moderate. Effective rooting depth is 20 to 40 inches, but penetration and distribution of roots are limited by the claypan above that depth. Runoff is very rapid, and the hazard of water erosion is very high.

The Sattley soil is deep and well drained. It formed in colluvium derived dominantly from rhyolite and rhyolitic tuff. Typically, the upper 4 inches of the surface layer is grayish brown gravelly loam and the lower 5 inches is grayish brown very gravelly loam. The upper 16 inches of the subsoil is brown and pale brown very gravelly clay loam, and the lower 6 inches is pale brown very gravelly loam. The substratum is light yellowish brown extremely cobbly loam 12 inches thick over fractured rhyolitic tuff.

Permeability of the Sattley soil is moderate. Available water capacity is moderate. Effective rooting depth is 40 to 60 inches or more. Runoff is rapid, and the hazard of water erosion is very high.

This unit is used for livestock grazing.

The potential plant community on the Cavanaugh soil is mainly low sagebrush and Idaho fescue. The potential plant community on the Sattley soil is mainly mountain big sagebrush, antelope bitterbrush, and Idaho fescue. If the range deteriorates, Idaho fescue and antelope

bitterbrush decrease and are gradually replaced by cheatgrass and rabbitbrush.

This unit is suited to livestock grazing in summer. It has only minor limitations. In some areas slope limits access by livestock, which may result in overgrazing of the less sloping areas. Placing salt on the side slopes and in the less intensively grazed areas encourages more uniform grazing. Steepness of slope and stoniness limit mechanical seeding.

The Sattley soil provides good habitat for deer.

The Cavanaugh soil is in capability subclass VIs, nonirrigated, and the Sattley soil is in capability subclass IVe, nonirrigated.

10—Crooked Creek-Bear Lake complex, 0 to 2 percent slopes. This map unit is on flood plains. Elevation is 5,295 to 5,300 feet. The average annual precipitation is about 15 inches, the average annual air temperature is about 44 degrees F, and the average frost-free period is 80 to 100 days.

This unit is about 50 percent Crooked Creek silt loam in the lower lying, concave areas and 30 percent Bear Lake loam in the slightly higher lying areas adjacent to depressional areas. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Included in this unit are small areas of Boulder Lake clay near channels and Tucker silty clay loam on the slightly higher terrace remnants. Also included are small areas of Disabel Variant silt loam scattered throughout the unit.

The Crooked Creek soil is very deep and very poorly drained. It formed in alluvium derived from mixed sources. Typically, the surface is covered with a mat of roots 1 inch thick. The surface layer is dark grayish brown silt loam 4 inches thick. The subsoil is dark gray clay 21 inches thick. The upper 16 inches of the substratum is light gray, light brownish gray, and dark gray silty clay loam, the next 9 inches is light brownish gray silt loam, and the lower part to a depth of 65 inches is pale yellow silty clay loam.

Permeability of the Crooked Creek soil is slow. Available water capacity is very high. Effective rooting depth is limited by a seasonal high water table that fluctuates between the surface and a depth of 1 foot from November through June. This soil is subject to ponding from November through June of every year. Runoff is slow, and the hazard of water erosion is slight.

The Bear Lake soil is very deep and poorly drained. It formed in silty alluvium derived from mixed sources. Typically, the surface layer is gray, calcareous silt loam 15 inches thick. The upper 15 inches of the subsoil is light gray, calcareous silt loam, the next 15 inches is light gray, calcareous silty clay loam, and the lower part to a depth of 60 inches or more is light gray silty clay.

Permeability of the Bear lake soil is slow. Available water capacity is very high. Effective rooting depth is limited by a seasonal high water table that fluctuates between the surface and a depth of 1 foot from November through June. This soil is subject to ponding from November through June of every year. Runoff is slow, and the hazard of water erosion is slight.

This unit is used for livestock grazing.

The potential plant community on the Crooked Creek soil is mainly tufted hairgrass, sedges, rushes, and other wetland plants. The potential plant community on the Bear Lake soil is mainly tufted hairgrass, slender wheatgrass, basin wildrye, and other meadow plants. If the range deteriorates, tufted hairgrass, slender wheatgrass, and sedges decrease and are gradually replaced by northern barley, Rocky Mountain iris, and other less desirable forage plants.

This unit is suited to livestock grazing in summer and fall. The main limitation is wetness in spring and early in summer because of seasonal ponding. Grazing should be delayed until the soil has drained sufficiently and is firm enough to withstand trampling by livestock. Limitations for mechanical seeding and brush control are severe during rainy periods and when the water table is high. If chemical brush control is used in areas subject to flooding, care should be taken to avoid contaminating streams. Rate and time of application are important considerations.

This unit provides valuable habitat for wetland wildlife. It is an important nesting area for egrets, many species of ducks, and other waterfowl.

This unit is poorly suited to hay and pasture. The main limitation is wetness because of ponding and the seasonal high water table.

This map unit is in capability subclass Vw, nonirrigated.

11—Deunah stony silt loam, 1 to 4 percent slopes. This moderately deep, well drained soil is on stable summits of tablelands. It formed in old alluvial and eolian material derived from mixed sources. Elevation is 5,500 to 6,000 feet. The average annual precipitation is about 15 inches, the average annual air temperature is about 44 degrees F, and the average frost-free period is 70 to 90 days.

Included in this unit are small areas of soils that are similar to the Deunah soil but are more than 35 percent rock fragments, Wickahoney rubbly silt loam and Wagonbox rubbly silty clay loam near the edges of tableland summits, Rubble land near escarpments, and Hatpeak silt loam on the same general landscape positions as the Deunah soil. Included areas make up about 25 percent of the total acreage.

Typically, less than 2 percent of the surface is covered with stones. The surface layer is pale brown stony silt loam 9 inches thick. The subsoil is dark yellowish brown clay 10 inches thick. The upper 4 inches of the substratum is very pale brown loam, and the lower part to a depth of 28 inches is a yellow, cemented hardpan. Basalt is at a depth of 28 inches.

Permeability of this Deunah soil is very slow. Available water capacity is moderate. Effective rooting depth is 20 to 34 inches, but penetration and distribution of roots are limited by the claypan above that depth. Runoff is medium, and the hazard of water erosion is slight. Water is perched above the very slowly permeable subsoil during rainy periods in spring.

This unit is used for livestock grazing.

The potential plant community on this unit is mainly alkali sagebrush and Idaho fescue. If the vegetation is in good or excellent condition, the native grasses are mainly Idaho fescue, bluebunch wheatgrass, and Sandberg bluegrass. If the potential plant community deteriorates, less preferred forage plants increase. Among the plants that increase are longleaf phlox and lupine.

This unit is suited to livestock grazing in spring. The main limitation is wetness. The soil in this unit is shallow to a claypan. In spring the claypan swells upon wetting and restricts the downward movement of water. The surface then becomes saturated, making this soil particularly susceptible to trampling and soil compaction. Compaction generally reduces the water intake rate, increases erosion, and ultimately reduces the productivity of the soil. Grazing should be delayed until the soil has drained sufficiently and is firm enough to withstand trampling by livestock.

This map unit is in capability subclass IVs.

12—Disabel Variant silt loam, 0 to 2 percent slopes. This very deep, moderately well drained soil is on flood plains and in drainageways. It formed in loamy alluvium derived from mixed sources. Elevation is 5,290 to 5,320 feet. The average annual precipitation is 13 to 16 inches, the average annual air temperature is 43 to 45 degrees F, and the average frost-free period is 80 to 100 days.

Included in this unit are small areas of Boulder Lake clay in depressional areas, Bluecreek Variant silt loam scattered throughout the unit, and Tucker Variant silt loam adjacent to drainageways. Included areas make up about 25 percent of the total acreage.

Typically, the surface layer is light gray silt loam 7 inches thick. The upper 16 inches of the subsoil is pale brown and light brownish gray clay, and the lower 19 inches is light gray clay loam. The substratum to a depth of 84 inches or more is light gray and white loam.

Permeability of this Disabel Variant soil is slow. Available water capacity is very high. Effective rooting depth is more than 60 inches, but penetration and distribution of roots are limited by the claypan above that depth. Runoff is very slow, and the hazard of water erosion is slight. This soil is subject to occasional, brief periods of flooding in March through May. Water is perched above the slowly permeable subsoil during floods and rainy periods.

This unit is used for livestock grazing.

The potential plant community on this unit is mainly silver sagebrush and bluegrasses. If the potential plant community deteriorates, less preferred forage plants increase. Among the plants that increase are northern barley, bottlebrush squirreltail, and sagebrush.

This unit is suited to livestock grazing in spring and fall. The main limitation for grazing, mechanical seeding, and brush control is wetness in spring. Grazing should be delayed until the soil has drained sufficiently and is firm enough to withstand trampling by livestock. Plants that tolerate wetness should be seeded. If chemical brush control is used in areas subject to flooding, care should be taken to avoid contaminating streams. Rate and time of application are important considerations.

This map unit is in capability subclass IVw, irrigated and nonirrigated.

13—Disabel Variant-Bluecreek complex, 0 to 3 percent slopes. This map unit is on low stream terraces and flood plains. Elevation is 5,295 to 5,310 feet. The average annual precipitation is about 15 inches, the average annual air temperature is about 44 degrees F, and the average frost-free period is 80 to 100 days.

This unit is about 55 percent Disabel Variant silt loam, 0 to 2 percent slopes, in depressional areas and drainageways and 25 percent Bluecreek sandy loam, 1 to 3 percent slopes, on the slightly higher terraces. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Included in this unit are small areas of Paynecreek sandy loam in convex areas on terraces, Thacker loam in convex areas on higher terrace remnants, and Bluecreek Variant silt loam in concave areas. Also included are small areas of soils that are scattered throughout the unit and are similar to the Blackfoot soil but are less than 18 percent clay between depths of 10 and 40 inches and small areas of soils that have slopes of 3 to 6 percent. An area of this unit about 0.75 mile west of the Mountain View Reservoir dam is subject to frequent, long periods of flooding in spring and early in summer.

The Disabel Variant soil is very deep and moderately well drained. It formed in loamy alluvium derived from mixed sources. Typically, the surface layer is light gray silt loam 7 inches thick. The upper 16 inches of the subsoil is pale brown and light brownish gray clay, and the lower 19 inches is light gray clay loam. The substratum to a depth of 84 inches or more is light gray and white loam.

Permeability of the Disabel Variant soil is slow. Available water capacity is very high. Effective rooting depth is more than 60 inches, but penetration and distribution of roots are limited by the claypan above that depth. Runoff is very slow, and the hazard of water erosion is slight. This soil is subject to occasional, brief periods of flooding in March through May. Water is

perched above the slowly permeable subsoil during floods and rainy periods.

The Bluecreek soil is moderately deep and well drained. It formed in alluvium derived dominantly from rhyolite and basalt. Typically, the surface layer is pale brown sandy loam 6 inches thick. The upper 5 inches of the subsoil is pale brown sandy loam, the next 9 inches is light yellowish brown clay loam, and the lower part to a depth of 26 inches is pale brown gravelly sandy loam. The next layer is a grayish brown, indurated hardpan 3 inches thick. The upper 10 inches of the substratum is gray very gravelly sand, the next 5 inches is a grayish brown, indurated hardpan, and the lower part to a depth of 84 inches or more is gray very gravelly sand.

Permeability of the Bluecreek soil is slow. Available water capacity is low. Effective rooting depth is 20 to 40 inches. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing is high.

This unit is used for livestock grazing.

The potential plant community on the Disabel Variant soil is mainly silver sagebrush and bluegrasses. The potential plant community on the Bluecreek soil is mainly basin big sagebrush, Idaho fescue, and bluebunch wheatgrass. If the potential plant community deteriorates, less preferred forage plants increase. Among the plants that increase are northern barley on the Disabel Variant soil and bottlebrush squirreltail on the Bluecreek soil. Sagebrush generally increases on both soils.

This unit is suited to livestock grazing late in spring, in summer, and in fall. The Bluecreek soil has few limitations for livestock grazing, rangeland seeding, or brush control. The main limitation of the Disabel Variant soil for livestock grazing is wetness in spring. Grazing should be delayed until the soil has drained sufficiently and is firm enough to withstand trampling by livestock. Limitations for mechanical seeding and brush control are moderate to severe during rainy periods. If chemical brush control is used in areas subject to flooding, care should be taken to avoid contaminating streams. Rate and time of application are important considerations.

This unit provides important habitat for wetland wildlife.

This unit is suited to irrigated hay and is poorly suited to irrigated cultivated crops. It is limited mainly by wetness in spring and early in summer and by the hazard of soil blowing.

This map unit is in capability subclass IVw, irrigated and nonirrigated.

14—Dranyon-Strickland-Parkay association, 2 to 30 percent slopes. This map unit is on plateaus. Elevation is 6,800 to 7,800 feet. The average annual precipitation is about 20 inches, the average annual air temperature is about 37 degrees F, and the average frost-free period is 20 to 50 days.

This unit is about 40 percent Dranyon loam, 4 to 30 percent slopes, on concave side slopes; 30 percent Strickland loam, 5 to 25 percent slopes, on foot slopes and convex side slopes; and 15 percent Parkay stony loam, 5 to 25 percent slopes, on shoulder slopes and convex side slopes.

Included in this unit are small areas of Bluebell loam and Rock outcrop on shoulder slopes and side slopes and Boulder Lake clay on semiwet bottom lands.

The Dranyon soil is deep and well drained. It formed in colluvium derived dominantly from basalt and tuff. Typically, the surface layer is dark grayish brown and brown loam 13 inches thick. The upper 23 inches of the subsoil is dark grayish brown and brown loam, and the lower part to a depth of 53 inches is yellowish brown very cobbly clay loam. Fractured bedrock is at a depth of 53 inches.

Permeability of the Dranyon soil is moderately slow. Available water capacity is very high. Effective rooting depth is 40 to 60 inches or more. Runoff is rapid, and the hazard of water erosion is very high.

The Strickland soil is moderately deep and well drained. It formed in slope alluvium derived dominantly from basalt and tuff. Typically, the surface layer is yellowish brown loam 13 inches thick. The subsoil is brown loam 15 inches thick. Bedrock is at a depth of 28 inches.

Permeability of the Strickland soil is moderate. Available water capacity is moderate. Effective rooting depth is 20 to 40 inches. Runoff is rapid, and the hazard of water erosion is very high.

The Parkay soil is deep and well drained. It formed in colluvium derived dominantly from basalt and tuff. Typically, as much as 1 percent of the surface is covered with stones. The upper 10 inches of the surface layer is dark grayish brown stony loam, and the lower 9 inches is dark grayish brown very cobbly loam. The subsoil is brown and light yellowish brown extremely cobbly clay loam 26 inches thick. Fractured bedrock is at a depth of 45 inches.

Permeability of the Parkay soil is moderately slow. Available water capacity is moderate. Effective rooting depth is 40 to 60 inches or more. Runoff is rapid, and the hazard of water erosion is very high.

This unit is used for livestock grazing.

The potential plant community on the Dranyon soil is mainly quaking aspen and an understory of meadowrue and mountain brome. The potential plant community on the Strickland soil is mainly mountain big sagebrush, mountain snowberry, and other deciduous shrubs and slender wheatgrass. The potential plant community on the Parkay soil is mainly mountain big sagebrush and Idaho fescue. If the range deteriorates, mountain brome, slender wheatgrass, and Idaho fescue decrease and are gradually replaced by needlegrass and bluegrass.

This unit is best suited to grazing in summer. The Dranyon soil has limited value for livestock grazing because of the relatively minor amounts of forage produced under unmanaged aspen stands. These stands

are important, however, for the shade they provide. Mechanical treatment is generally not practical on the Dranyon soil. The Strickland soil provides limited amounts of forage because a high percentage of the plants on the soil are unpalatable shrubs. The Parkay soil has few limitations for livestock grazing. Limitations for mechanical seeding and brush control are slight to moderate, depending on the content of stones.

The Dranyon and Strickland soils provide good habitat for deer.

The Dranyon and Strickland soils are in capability subclass VIe, nonirrigated, and the Parkay soil is in capability subclass IVe, nonirrigated.

15—Haploxeralfs-Durixeralfs-Rubble land complex, 20 to 50 percent slopes. This map unit is on basalt escarpments and side slopes of tablelands. Elevation is 5,300 to 6,400 feet. The average annual precipitation is about 15 inches, the average annual air temperature is about 44 degrees F, and the average frost-free period is 70 to 100 days.

This unit is about 40 percent Haploxeralfs, 20 to 50 percent slopes, commonly on shoulder slopes and back slopes; 20 percent Durixeralfs, 20 to 30 percent slopes, commonly on toe slopes and foot slopes; and 20 percent Rubble land, 20 to 50 percent slopes, throughout the unit. The soils in this unit are highly variable and cannot be mapped consistently as phases of soil series. The components are so intricately intermingled that it was not practical to map them separately at the scale used.

Included in this unit are small areas of Rock outcrop scattered throughout the unit and basalt cliffs near the top of the escarpments.

Haploxeralfs are shallow to very deep and are well drained. They formed in colluvium derived dominantly from basalt. A reference profile has a surface layer of pale brown extremely stony loam 2 inches thick. The upper 4 inches of the subsoil is brown clay loam, and the lower 11 inches is brown cobbly clay. Basalt is at a depth of 17 inches. Depth to bedrock ranges from 10 inches to more than 60 inches. The surface ranges from stony to rubbly. The subsoil ranges from loam to clay that is 5 to 80 percent rock fragments.

Permeability of these soils is moderate to slow. Available water capacity is very low to very high. Effective rooting depth is 10 inches or more. Runoff is very rapid, and the hazard of water erosion is very high.

Durixeralfs are shallow or moderately deep and are well drained. They formed in colluvium derived dominantly from basalt. A reference profile has a surface layer of light brownish gray extremely stony loam 5 inches thick over light grayish brown loam 3 inches thick. The upper 8 inches of the subsoil is pale brown clay loam, the next 5 inches is brown clay, and the lower part to a depth of 29 inches is yellow loam. The next layer is a very pale brown, cemented hardpan about 4 inches thick over basalt. Depth to the hardpan ranges from 10 to 40 inches. The surface ranges from stony to rubbly. The subsoil ranges from loam to clay that is 5 to 80 percent rock fragments.

Permeability of these soils is moderate to slow. Available water capacity is very low to very high. Effective rooting depth is 10 to 40 inches. Runoff is very rapid, and the hazard of water erosion is very high.

Rubble land consists of areas that are covered with basalt stones and that support little if any vegetation. Commonly, the stones are underlain by a thin layer of clayey soil material over bedrock.

This unit is used for livestock grazing.

The potential plant community on this unit is a complex of several plant communities. It is about 30 percent basin big sagebrush and Idaho fescue, 20 percent low sagebrush and Idaho fescue, 30 percent mountain big sagebrush and Idaho fescue, and scattered serviceberry and snowberry. Production is about 800 pounds per acre in areas of basin big sagebrush and Idaho fescue, 600 pounds per acre in areas of low sagebrush and Idaho fescue, and 1,300 pounds per acre in areas of mountain big sagebrush and Idaho fescue.

Because of the variability of the soils in this unit, specific plant communities could not be correlated to individual soils; however, the plant communities can be correlated to general soil characteristics. Mountain big sagebrush-Idaho fescue and basin big sagebrush-Idaho fescue plant communities are generally on moderately deep to very deep loamy soils that have less than 60 percent rock fragments in the profile. The low sagebrush-Idaho fescue plant community is generally on soils that have a root-restricting layer at a shallow depth. This restrictive layer consists of bedrock, a hardpan, a claypan, a clayey subsoil containing rock fragments, or a loamy subsoil containing more than 60 percent rock fragments. The mountain big sagebrush-Idaho fescue plant community is mainly on west-facing side slopes, the basin big sagebrush-Idaho fescue plant community is generally on east-facing side slopes, and the low sagebrush-Idaho fescue plant community is on east- and west-facing side slopes.

The main limitations of this unit for livestock grazing are stoniness and steepness of slope. Mechanical seeding and brush control are severely restricted because of these limitations.

This map unit is in capability subclass VIIs.

16—Hayspur clay loam, 0 to 2 percent slopes. This very deep, poorly drained soil is on flood plains and in sloughs. It formed in recent stratified alluvium derived from mixed sources. Elevation is 5,290 to 5,420 feet. The average annual precipitation is about 15 inches, the average annual air temperature is about 44 degrees F, and the average frost-free period is 80 to 100 days.

Included in this unit are small areas of soils that are similar to this Hayspur soil but have sand and gravel at a

depth of 40 inches or less and small areas of sand and gravel bars in and near channels. Also included are small areas of Bear Lake silt loam on hummocks and soils that are similar to this Hayspur soil but are high in content of sodium and are scattered throughout the unit. Included areas make up about 40 percent of the total acreage.

Typically, the upper 13 inches of the surface layer is grayish brown clay loam and the lower 8 inches is light brownish gray clay loam. Below this to a depth of 30 inches is a buried surface layer of gray loam. The subsoil is light gray silt loam 10 inches thick. The upper 19 inches of the substratum is light gray silt loam, and the lower part to a depth of 84 inches or more is variegated very gravelly loamy sand.

Permeability of this Hayspur soil is moderately slow to a depth of 59 inches and rapid below this depth. Available water capacity is very high. Effective rooting depth is limited by a seasonal high water table that fluctuates between the surface and a depth of 1 foot from March through June. This soil is subject to frequent, long periods of flooding in March through June. Runoff is slow, and the hazard of water erosion is slight.

This unit is used for hay and pasture and for livestock grazing.

This unit is suited to irrigated hay and pasture. It is limited mainly by wetness in spring and early in summer. Wetness limits the choice of plants and the period of cutting and grazing. The seasonal high water table generally limits the suitability of the soil for deep-rooted crops. Subsurface drainage can be used to lower the water table if a suitable outlet is available.

After the water table is lowered, irrigation is needed for maximum production of hay and pasture. Border, corrugation, and sprinkler irrigation systems are suited to the soil in this unit. Irrigation water needs to be applied carefully to prevent the buildup of a high water table. Drainage may also be needed. For the efficient application and distribution of surface irrigation water, leveling may be needed.

The potential plant community on this unit is mainly tufted hairgrass, slender wheatgrass, sedges, rushes, and other meadow plants. If the range deteriorates, tufted hairgrass, slender wheatgrass, and sedges decrease and are gradually replaced by less desirable forage plants. Rushes generally increase.

This unit is suited to livestock grazing in summer and fall. The main limitation is wetness in spring and early in summer. Grazing should be delayed until the soil has drained sufficiently and is firm enough to withstand trampling by livestock. Limitations for mechanical seeding are moderate to severe during rainy periods and when the water table is high. Plants that tolerate wetness should be seeded. If chemical brush control is used in areas subject to flooding, care should be taken to avoid contaminating streams. Rate and time of application are important considerations.

This unit provides important habitat for wetland wildlife.

This map unit is in capability subclass Vw, irrigated and nonirrigated.

17—Hayspur-Blackfoot complex, 0 to 2 percent slopes. This map unit is on flood plains of the Owyhee River. Elevation is 5,350 to 5,420 feet. The average annual precipitation is about 15 inches, the average annual air temperature is about 44 degrees F, and the average frost-free period is 80 to 100 days.

This unit is about 40 percent Hayspur clay loam in the lower, generally concave areas and in channels and 30 percent Blackfoot silt loam in the higher, generally convex areas. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Included in this unit are small areas of very poorly drained soils in sloughs and drainageways and Paynecreek gravelly loam and Thacker loam on the higher terrace remnants. Also included are small areas of soils that are similar to the Hayspur and Blackfoot soils but have sand and gravel within 40 inches of the surface or are more than 35 percent clay between depths of 10 and 40 inches and small deposits of sand and gravel that are scattered throughout the unit.

The Hayspur soil is very deep and poorly drained. It formed in recent stratified alluvium derived from mixed sources. Typically, the upper 13 inches of the surface layer is grayish brown clay loam and the lower 8 inches is light brownish gray clay loam. Below this to a depth of 30 inches is a buried surface layer of gray loam. The subsoil is light gray silt loam 10 inches thick. The upper 19 inches of the substratum is light gray silt loam, and the lower part to a depth of 84 inches or more is variegated very gravelly loamy sand.

Permeability of the Hayspur soil is moderately slow to a depth of 59 inches and rapid below this depth. Available water capacity is very high. Effective rooting depth is limited by a seasonal high water table that fluctuates between the surface and a depth of 1 foot from March through June. This soil is subject to frequent, long periods of flooding in March through June. Runoff is slow, and the hazard of water erosion is slight.

The Blackfoot soil is very deep and somewhat poorly drained. It formed in recent stratified alluvium derived from mixed sources. Typically, the upper 7 inches of the surface layer is grayish brown silt loam and the lower 6 inches is grayish brown loam. The upper 7 inches of the subsoil is light brownish gray loam. Below this is a buried surface layer of grayish brown loam 7 inches thick. The lower part of the subsoil is light gray loam 7 inches thick. Below this to a depth of 45 inches is a buried surface layer of dark gray silty clay loam. The upper 20 inches of the substratum is pale yellow clay loam, and the lower part to a depth of 84 inches or more is variegated extremely gravelly coarse sand.

Permeability of the Blackfoot soil is moderately slow. Available water capacity is very high. Effective rooting depth is limited by a seasonal high water table that is at a depth of 1.5 to 3.0 feet from March through May. Runoff is slow, and the hazard of water erosion is slight.

This unit is used for hay and pasture.

This unit is suited to irrigated hay and pasture. It is limited mainly by wetness in spring and early in summer. Wetness limits the choice of plants and the period of cutting and grazing. Grazing should be delayed until the soil has drained sufficiently and is firm enough to withstand trampling by livestock. The seasonal high water table generally limits the suitability of this unit for deep-rooted crops. Subsurface drainage can be used to lower the water table if a suitable outlet is available.

After the water table is lowered, irrigation is needed for maximum production of hay and pasture. Border, corrugation, and sprinkler irrigation systems are suited to this unit. Irrigation water needs to be applied carefully to prevent the buildup of a high water table. Drainage may also be needed. For the efficient application and distribution of surface irrigation water, leveling may be needed.

This map unit is in capability subclass Vw, irrigated and nonirrigated.

18—Hayspur-Zola, frequently flooded-Paynecreek complex, 0 to 4 percent slopes. This map unit is on flood plains and terraces of the Owyhee River and Sheep Creek. Elevation is 5,420 to 5,600 feet. The average annual precipitation is 13 to 16 inches, the average annual air temperature is 43 to 45 degrees F, and the average frost-free period is 80 to 100 days.

This unit is about 50 percent Hayspur clay loam on the lower lying flood plains, 20 percent Zola loam, frequently flooded, on the higher lying flood plains, and 20 percent Paynecreek gravelly loam on high terraces. The Hayspur and Zola soils have slopes of 0 to 2 percent, and the Paynecreek soil has slopes of 1 to 4 percent. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Included in this unit are small areas of Thacker loam on high terraces and small areas of Riverwash near the Owyhee River.

The Hayspur soil is very deep and poorly drained. It formed in recent stratified alluvium derived from mixed sources. Typically, the upper 13 inches of the surface layer is grayish brown clay loam and the lower 8 inches is light brownish gray clay loam. Below this to a depth of 30 inches is a buried surface layer of gray loam. The subsoil is light gray silt loam 10 inches thick. The upper 19 inches of the substratum is light gray silt loam, and the lower part to a depth of 84 inches or more is variegated very gravelly loamy sand.

Permeability of the Hayspur soil is moderately slow to a depth of 59 inches and rapid below this depth. Available water capacity is very high. Effective rooting depth is limited by a seasonal high water table that fluctuates between the surface and a depth of 1 foot from March through June. This soil is subject to frequent, long periods of flooding in March through June. Runoff is slow, and the hazard of water erosion is slight.

The Zola soil is very deep and moderately well drained. It formed in recent stratified alluvium derived from mixed sources. Typically, the surface layer is grayish brown loam 16 inches thick. Below this is a buried surface layer of grayish brown silty clay loam 12 inches thick. The subsoil is light brownish gray, calcareous loam 17 inches thick. The upper 20 inches of the substratum is light brownish gray loam, the next 8 inches is variegated loamy coarse sand, and the lower part to a depth of 84 inches or more is light brownish gray clay loam.

Permeability of the Zola soil is moderately slow. Available water capacity is very high. Effective rooting depth is limited by a seasonal high water table that is at a depth of 3 to 5 feet from March through June. This soil is subject to frequent, long periods of flooding in March through June. Runoff is slow, and the hazard of water erosion is slight.

The Paynecreek soil is very deep and well drained. It formed in gravelly alluvium derived from mixed sources. Typically, the surface layer is brown gravelly loam 8 inches thick. The upper 4 inches of the subsoil is yellowish brown gravelly loam, the next 13 inches is yellowish brown gravelly sandy clay loam, and the lower part to a depth of 45 inches is light yellowish brown gravelly clay loam. The substratum to a depth of 84 inches or more is variegated very gravelly loamy coarse sand.

Permeability of the Paynecreek soil is moderately slow to a depth of 45 inches and rapid below this depth. Available water capacity is high to very high. Effective rooting depth is 60 inches or more. Runoff is slow, and the hazard of water erosion is slight.

This unit is used for livestock grazing. It is used heavily by cattle and horses because of its proximity to water.

The potential plant community on the Hayspur soil is mainly tufted hairgrass, slender wheatgrass, sedges, and rushes. If the range deteriorates, tufted hairgrass and slender wheatgrass decrease and are gradually replaced by northern barley and bluegrasses. Rushes generally increase.

The potential plant community on the Zola and Paynecreek soils is mainly basin big sagebrush, Idaho fescue, and bluebunch wheatgrass. If the potential plant community deteriorates, less preferred forage plants increase. Among the plants that increase are basin big sagebrush, rabbitbrush, and lupine.

This unit is suited to livestock grazing in summer. The main limitation is wetness of the Hayspur soil in spring and early in summer. Grazing should be delayed until the soil has drained sufficiently and is firm enough to

withstand trampling by livestock. Limitations for mechanical seeding and brush control are moderate during rainy periods and when the water table is high. If chemical brush control is used in areas subject to flooding, care should be taken to avoid contaminating streams. Rate and time of application are important considerations. Placing salt away from water and in less intensively grazed areas encourages more uniform grazing.

This map unit is in capability subclass Vw.

19—Lasauses Variant-Boulder Lake association, 0 to 1 percent slopes. This map unit is in intermittent lakebeds. Elevation is about 5,670 feet. The average annual precipitation is about 15 inches, the average annual air temperature is about 44 degrees F, and the average frost-free period is 70 to 90 days.

This unit is about 75 percent Lasauses Variant clay in the center of lakebeds and 25 percent Boulder Lake clay near the edges of lakebeds.

The Lasauses Variant soil is very deep and poorly drained. It formed in lacustrine sediment, dominantly from the surrounding basalt plateau. Typically, the surface layer is white silt loam 1 inch thick. The upper 21 inches of the subsoil is grayish brown and pale olive clay, and the lower 36 inches is light olive gray, calcareous clay. The substratum to a depth of 66 inches or more is pale yellow, calcareous clay.

Permeability of the Lasauses Variant soil is very slow. Available water capacity is very high. Effective rooting depth is 60 inches or more. This soil is subject to ponding from November through June of every year.

The Boulder Lake soil is very deep and somewhat poorly drained. It formed in lacustrine sediment, dominantly from the surrounding basalt plateau. Typically, the surface layer is gray and grayish brown clay 26 inches thick. The subsoil is light brownish gray, calcareous clay 36 inches thick. The substratum to a depth of 72 inches or more is light brownish gray, calcareous clay.

Permeability of the Boulder Lake soil is very slow. Available water capacity is very high. Effective rooting depth is 60 inches or more. This soil is subject to ponding from November through June of every year.

This unit is used for livestock grazing.

The potential plant community on the Lasauses Variant soil is mainly rushes. This soil is seasonally ponded wetland. The potential plant community on the Boulder Lake soil is mainly silver sagebrush and alkali bluegrass. If the potential plant community deteriorates, less preferred forage plants increase. Among the plants that increase are sagebrush, lupine, and thistle.

This unit is suited to livestock grazing in summer. The main limitation of the Boulder Lake soil is wetness in spring and early in summer. Because this unit is in intermittent lakebeds, managing for use as range is difficult. The unit is most important as a source of livestock water in spring. The forage around the edges of the lakebeds is easily overgrazed. Placing salt away from the intensively grazed areas adjacent to the lakebeds will reduce some of this grazing pressure.

This map unit is in capability subclass VIw.

20—Moonstone-Earcree association, 20 to 45 percent slopes. This map unit is on hillsides and mountainsides. Elevation is 5,600 to 6,900 feet. The average annual precipitation is 14 to 18 inches, the average annual air temperature is 39 to 43 degrees F, and the average frost-free period is 30 to 70 days.

This unit is about 45 percent Moonstone gravelly coarse sandy loam on south- and west-facing side slopes and on convex side slopes and 35 percent Earcree gravelly coarse sandy loam on north- and east-facing side slopes and on concave side slopes.

Included in this unit are small areas of Bearskin Variant loam and Rock outcrop on ridgetops and small areas of Watchabob gravelly coarse sandy loam scattered throughout the unit.

The Moonstone soil is moderately deep and well drained. It formed in colluvium and residuum derived dominantly from granite. Typically, the surface layer is dark grayish brown gravelly coarse sandy loam 22 inches thick. The subsoil is brown gravelly coarse sandy loam 6 inches thick. Weathered granite is at a depth of 28 inches.

Permeability of the Moonstone soil is moderately rapid. Available water capacity is low. Effective rooting depth is 24 to 40 inches. Runoff is very rapid, and the hazard of water erosion is very high.

The Earcree soil is very deep and well drained. It formed in colluvium derived dominantly from granite. Typically, the upper 6 inches of the surface layer is brown gravelly coarse sandy loam and the lower 35 inches is dark grayish brown and grayish brown coarse sandy loam. The underlying material to a depth of 64 inches or more is brown gravelly loamy coarse sand.

Permeability of the Earcree soil is moderately rapid. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is very rapid, and the hazard of water erosion is very high.

This unit is used for livestock grazing.

The potential plant community on the Moonstone soil is mainly mountain big sagebrush and bluebunch wheatgrass. The potential plant community on the Earcree soil is mainly mountain big sagebrush and Idaho fescue. If the range deteriorates from overgrazing, bluebunch wheatgrass and Idaho fescue decrease and are gradually replaced by cheatgrass and needlegrass.

This unit is suited to livestock grazing in summer. The main limitation is steepness of slope in some areas. Steepness of slope limits access by livestock and may result in overgrazing of the less sloping areas. Placing salt on side slopes and in less intensively grazed areas encourages more uniform grazing. Areas on south-facing

side slopes are more droughty than other areas. For this reason, pasture on south-facing side slopes is more likely to deteriorate because of overgrazing. Regenerating pasture can be difficult in the drier areas. Rangeland seeding and brush control by mechanical methods are also limited because of steepness of slope.

This map unit is in capability subclass VIe.

21—Parkay-Dranyon-Cavanaugh complex, 15 to 50 percent slopes. This map unit is on hillsides and mountainsides. Elevation is 6,200 to 7,600 feet. The average annual precipitation is 16 to 22 inches, the average annual air temperature is 41 to 43 degrees F, and the average frost-free period is 30 to 70 days.

This unit is about 35 percent Parkay stony loam, 25 to 50 percent slopes, dominantly on north- and east-facing, convex side slopes; 25 percent Dranyon loam, 20 to 50 percent slopes, on north- and east-facing, concave side slopes; and 20 percent Cavanaugh very stony loam, 15 to 40 percent slopes, dominantly on south- and west-facing, convex side slopes. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Included in this unit are small areas of soils that are similar to the Cavanaugh soil but have bedrock within 20 inches of the surface, Rock outcrop on ridgetops and hilltops, Obray stony clay in concave areas, and soils that are extremely stony at the surface.

The Parkay soil is deep and well drained. It formed in colluvium derived dominantly from rhyolite and rhyolitic tuff. Typically, as much as 1 percent of the surface is covered with stones. The upper 10 inches of the surface layer is dark grayish brown stony loam, and the lower 9 inches is dark grayish brown very cobbly loam. The subsoil is brown and light yellowish brown extremely cobbly clay loam 26 inches thick. Fractured rhyolitic tuff is at a depth of 45 inches.

Permeability of the Parkay soil is moderately slow. Available water capacity is moderate. Effective rooting depth is 40 to 60 inches or more. Runoff is very rapid, and the hazard of water erosion is very high.

The Dranyon soil is deep and well drained. It formed in colluvium derived dominantly from rhyolite and rhyolitic tuff. Typically, the surface layer is dark grayish brown and brown loam 13 inches thick. The upper 23 inches of the subsoil is dark grayish brown and brown loam, and the lower 17 inches is yellowish brown very cobbly clay loam. Fractured rhyolitic tuff is at a depth of 53 inches.

Permeability of the Dranyon soil is moderately slow. Available water capacity is very high. Effective rooting depth is 40 to 60 inches or more. Runoff is very rapid, and the hazard of water erosion is very high.

The Cavanaugh soil is moderately deep and well drained. It formed in colluvium derived dominantly from rhyolite and rhyolitic tuff. Typically, 3 to 15 percent of the surface is covered with stones. The surface layer is grayish brown very stony loam 5 inches thick. The upper 16 inches of the subsoil is grayish brown and brown cobbly clay loam, and the lower 11 inches is light yellowish brown very cobbly clay. Rhyolite is at a depth of 32 inches.

Permeability of the Cavanaugh soil is slow. Available water capacity is moderate. Effective rooting depth is 20 to 40 inches, but penetration and distribution of roots are limited by the claypan above that depth. Runoff is very rapid, and the hazard of water erosion is high.

This unit is used mainly for livestock grazing. The timber on the Dranyon soil is used for firewood, posts, and poles.

The potential plant community on the Parkay soil is mainly mountain big sagebrush, mountain snowberry, and Idaho fescue. The potential plant community on the Dranyon soil is mainly quaking aspen. The understory vegetation is mainly mountain brome and meadowrue. The potential plant community on the Cavanaugh soil is mainly low sagebrush and Idaho fescue. If the range deteriorates, Idaho fescue and mountain brome decrease and are gradually replaced by less desirable grasses. Sagebrush and rabbitbrush generally increase.

This unit is suited to livestock grazing in summer. The main limitation is steepness of slope in some areas. Steepness of slope limits access by livestock and may result in overgrazing of less sloping areas. Placing salt on side slopes and in less intensively grazed areas encourages more uniform grazing. Rangeland seeding by mechanical methods is also limited because of steepness of slope.

The Parkay and Dranyon soils provide good habitat for deer.

This map unit is in capability subclass VIIe.

22—Parkay-Wickahoney-Boulder Lake complex, 0 to 30 percent slopes. This map unit is on escarpments, side slopes, and flood plains between tableland summits. Elevation is 5,800 to 6,700 feet. The average annual precipitation is about 16 inches, the average annual air temperature is about 41 degrees F, and the average frost-free period is 50 to 70 days.

This unit is about 45 percent Parkay stony loam, 5 to 25 percent slopes, generally on east- and northeast-facing back slopes and foot slopes; 25 percent Wickahoney rubbly silt loam, 2 to 30 percent slopes, generally on west-facing side slopes; and 15 percent Boulder Lake clay, 0 to 2 percent slopes, on semiwet bottom lands. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Included in this unit are small areas of Rock outcrop and Rubble land on shoulder slopes and back slopes, basalt cliffs near the top of escarpments, and Tucker silty clay loam on flood plains.

The Parkay soil is deep and well drained. It formed in colluvium derived dominantly from basalt and tuff. Typically, as much as 3 percent of the surface is

covered with stones. The upper 10 inches of the surface layer is dark grayish brown stony loam, and the lower 9 inches is dark grayish brown very cobbly loam. The subsoil is brown and light yellowish brown extremely cobbly clay loam 26 inches thick. Fractured bedrock is at a depth of 45 inches.

Permeability of the Parkay soil is moderately slow. Available water capacity is moderate. Effective rooting depth is 40 to 60 inches or more. Runoff is rapid, and the hazard of water erosion is very high.

The Wickahoney soil is shallow and well drained. It formed in material derived dominantly from basalt. Typically, 50 to 90 percent of the surface is covered with stones. The upper 4 inches of the surface layer is light brownish gray rubbly silt loam, and the lower 2 inches is grayish brown cobbly clay loam. The subsoil is brown very cobbly clay 10 inches thick. Basalt is at a depth of 16 inches.

Permeability of the Wickahoney soil is slow. Available water capacity is very low. Effective rooting depth is 10 to 20 inches. Runoff is rapid, and the hazard of water erosion is moderate. Water is perched above the slowly permeable subsoil in spring.

The Boulder Lake soil is very deep and somewhat poorly drained. It formed in clayey alluvium derived from mixed sources. Typically, the surface layer is gray and grayish brown clay 26 inches thick. The subsoil is light brownish gray, calcareous clay 36 inches thick. The substratum to a depth of 84 inches or more is light brownish gray, calcareous clay.

Permeability of the Boulder Lake soil is very slow. Available water capacity is very high. Effective rooting depth is limited by a seasonal high water table that is at a depth of 1.5 to 3.0 feet from March through June. This soil is subject to frequent, long periods of flooding in March through June. Runoff is slow, and the hazard of water erosion is slight.

This unit is used for livestock grazing.

The potential plant community on the Parkay soil is mainly mountain big sagebrush, mountain snowberry, and Idaho fescue. The potential plant community on the Wickahoney soil is mainly alkali sagebrush, low sagebrush, and Idaho fescue. The potential plant community on the Boulder Lake soil is mainly silver sagebrush and alkali bluegrass. If the range deteriorates, palatable perennial grasses decrease and are gradually replaced by less desirable grasses and forbs, such as western needlegrass, bottlebrush squirreltail, phlox, and lupine. Sagebrush generally increases.

This unit is suited to livestock grazing in summer. The main limitations are large stones and boulders on the surface of the Parkay and Wickahoney soils and wetness of the Boulder Lake soil early in summer. Limitations for mechanical seeding and brush control are moderate to severe, depending on the stoniness of the surface.

This map unit is in capability subclass VIIs.

23—Paynecreek gravelly loam, 1 to 4 percent slopes. This very deep, well drained soil is on stream terraces. It formed in gravelly alluvium derived from mixed sources. Elevation is 5,290 to 5,385 feet. The average annual precipitation is about 15 inches, the average annual air temperature is about 44 degrees F, and the average frost-free period is 80 to 100 days.

Included in this unit are small areas of Thacker loam, dry, in depressional areas and near the edge of terraces and small areas of a soil that is similar to the Paynecreek soil but is very gravelly throughout and is in drainageways. Also included are small areas of soils that have slopes of 4 to 6 percent. Included areas make up about 20 percent of the total acreage.

Typically, the surface layer is brown gravelly loam 8 inches thick. The upper 4 inches of the subsoil is yellowish brown gravelly loam, the next 13 inches is yellowish brown gravelly sandy clay loam, and the lower part to a depth of 45 inches is light yellowish brown gravelly clay loam. The substratum to a depth of 84 inches or more is variegated very gravelly loamy coarse sand.

Permeability of this Paynecreek soil is moderately slow to a depth of 45 inches and rapid below this depth. Available water capacity is high to very high. Effective rooting depth is 60 inches or more. Runoff is slow, and the hazard of water erosion is slight.

Most areas of this unit are used for irrigated hay and pasture. A few areas are used as rangeland.

This unit is well suited to hay and pasture. It has few limitations. Border, corrugation, and sprinkler irrigation systems are suited to the unit. For the efficient application and distribution of surface irrigation water, leveling may be needed.

This unit is suited to irrigated barley and wheat. It has few limitations. The unit also has potential for the production of nonirrigated winter wheat.

The potential plant community on this unit is mainly basin big sagebrush, Idaho fescue, and bluebunch wheatgrass. If the range deteriorates, Idaho fescue and bluebunch wheatgrass decrease and are gradually replaced by cheatgrass and bottlebrush squirreltail. Sagebrush and rabbitbrush generally increase.

This unit is suited to livestock grazing in spring and fall. It has only minor limitations. Availability of water for livestock may be a concern in fall. The unit is suited to brush control by chemicals.

This map unit is in capability subclass IIIs, irrigated and nonirrigated.

24—Paynecreek gravelly loam, 8 to 16 percent slopes. This very deep, well drained soil is on dissected stream terraces. It formed in gravelly alluvium derived from mixed sources. Elevation is 5,270 to 5,390 feet. The average annual precipitation is about 15 inches, the average annual air temperature is about 44 degrees F, and the average frost-free period is 80 to 100 days.

Included in this unit are small areas of Thacker loam, dry, on convex shoulder slopes, a soil that is similar to this Paynecreek soil but is very gravelly loam throughout the profile, and Zola loam in wide drainageways. Also included are small areas of soils that have slopes of 4 to 8 percent or 16 to 20 percent. Included areas make up about 20 percent of the total acreage.

Typically, the surface layer is brown gravelly loam 11 inches thick. The upper 6 inches of the subsoil is yellowish brown gravelly loam, the next 21 inches is light yellowish brown gravelly clay loam, and the lower part to a depth of 50 inches is light yellowish brown gravelly sandy loam. The substratum to a depth of 84 inches or more is variegated very gravelly loamy coarse sand.

Permeability of this Paynecreek soil is moderately slow to a depth of 50 inches and rapid below this depth. Available water capacity is high to very high. Effective rooting depth is 60 inches or more. Runoff is rapid, and the hazard of water erosion is moderate.

This unit is used for livestock grazing.

The potential plant community on this unit is mainly basin big sagebrush, Idaho fescue, and bluebunch wheatgrass. If the range deteriorates, Idaho fescue and bluebunch wheatgrass decrease and are gradually replaced by cheatgrass and bottlebrush squirreltail. Sagebrush and rabbitbrush generally increase.

This unit is suited to livestock grazing in spring and fall. It has only minor limitations. Availability of water for livestock may be a concern in fall. The unit is suited to brush control by chemicals.

This unit is poorly suited to irrigated cultivated crops. It is limited mainly by steepness of slope and the hazard of erosion. All tillage should be on the contour or across the slope. Erosion can be controlled by growing pasture plants.

This map unit is in capability subclasses IVe, irrigated, and IIIe, nonirrigated.

25—Paynecreek-Thacker, dry complex, 4 to 10 percent slopes. This map unit is on dissected alluvial terraces. Elevation is 5,270 to 5,360 feet. The average annual precipitation is about 15 inches, the average annual air temperature is about 44 degrees F, and the average frost-free period is 80 to 100 days.

This unit is about 65 percent Paynecreek gravelly loam on side slopes and in draws and 20 percent Thacker loam, dry, on shoulder slopes and convex side slopes. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Included in this unit are small areas of Soonahbe silt loam on ridgetops and a soil that is similar to the Paynecreek soil but has secondary carbonates, is clayey in the subsoil, and is scattered throughout the unit. Also included are small areas of soils that have slopes of 1 to 4 percent or 10 to 12 percent.

The Paynecreek soil is very deep and well drained. It formed in gravelly alluvium derived from mixed sources. Typically, the surface layer is brown gravelly loam 11 inches thick. The upper 6 inches of the subsoil is yellowish brown gravelly loam, the next 21 inches is light yellowish brown gravelly clay loam, and the lower part to a depth of 50 inches is light yellowish brown gravelly sandy loam. The substratum to a depth of 84 inches or more is variegated very gravelly loamy coarse sand.

Permeability of the Paynecreek soil is moderately slow to a depth of 50 inches and rapid below this depth. Available water capacity is high to very high. Effective rooting depth is 60 inches or more. Runoff is rapid, and the hazard of water erosion is moderate.

The Thacker soil is moderately deep and well drained. It formed in alluvium derived from mixed sources. Typically, the upper 4 inches of the surface layer is pale brown loam and the lower 8 inches is pale brown gravelly loam. The subsoil is dark yellowish brown clay 9 inches thick. A light yellowish brown, indurated hardpan is at a depth of 21 inches. The upper 13 inches of the substratum is light yellowish brown, slightly cemented extremely gravelly sand, and the lower part to a depth of 84 inches or more is strata of gravelly sand and sand.

Permeability of the Thacker soil is very slow. Available water capacity is low to moderate. Effective rooting depth is 20 to 40 inches, but penetration and distribution of roots are limited by the claypan above that depth. Runoff is rapid, and the hazard of water erosion is moderate. Water is perched above the very slowly permeable subsoil during rainy periods in spring.

This unit is used mainly for livestock grazing. It is also used as irrigated cropland.

The potential plant community on the Paynecreek soil is mainly basin big sagebrush, Idaho fescue, and bluebunch wheatgrass. The potential plant community on the Thacker soil is mainly stunted basin big sagebrush, Idaho fescue, and bluebunch wheatgrass. If the range deteriorates, Idaho fescue and bluebunch wheatgrass decrease and are gradually replaced by less desirable annual and perennial grasses such as cheatgrass and bottlebrush squirreltail. Basin big sagebrush and rabbitbrush generally increase.

This unit is suited to livestock grazing in spring and fall. It has only minor limitations. Availability of water for livestock may be a concern in fall.

This unit is poorly suited to irrigated cultivated crops. It is limited mainly by the hazard of erosion and by the shallow depth to the claypan in the Thacker soil. To help control erosion, all tillage should be on the contour or across the slope. The flow of runoff in drainageways can be reduced by the use of grassed waterways. The claypan in the Thacker soil restricts the growth of roots and the movement of water through the profile. Subsoiling opens up this claypan and allows water and roots to pass through. Moldboard plowing may bring the

claypan to the surface; therefore, field preparations such as subsoiling and disking are better suited to this soil.

Sprinkler irrigation is a suitable method of applying water. Because of the very slow permeability of the Thacker soil, applications of irrigation water should be light and frequent.

This map unit is in capability subclass IVe, irrigated and nonirrigated.

26—Petan-Deunah-Hatpeak complex, 1 to 8 percent slopes. This map unit is on tablelands. Elevation is 5,500 to 5,600 feet. The average annual precipitation is 13 to 15 inches, the average annual air temperature is 43 to 45 degrees F, and the average frost-free period is 70 to 90 days.

This unit is about 35 percent Petan extremely stony loam, 4 to 8 percent slopes, on side slopes; 30 percent Deunah stony silt loam, 1 to 4 percent slopes, on tableland summits; and 25 percent Hatpeak silt loam, 1 to 4 percent slopes, on tableland summits and in draws. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Included in this unit are small areas of Wickahoney rubbly silt loam on side slopes and Torney Variant silt loam in drainageways.

The Petan soil is shallow and well drained. It formed in material derived dominantly from basalt. Typically, 15 to 50 percent of the surface is covered with stones. The surface layer is brown extremely stony loam 7 inches thick. The upper 3 inches of the subsoil is brown very stony loam, and the lower 7 inches is yellowish brown very stony clay. Below this is a reddish yellow, indurated hardpan 4 inches thick. Basalt is at a depth of 21 inches.

Permeability of the Petan soil is very slow. Available water capacity is very low. Effective rooting depth is 14 to 20 inches. Runoff is rapid, and the hazard of water erosion is moderate. Water is perched above the very slowly permeable subsoil during rainy periods in spring.

The Deunah soil is moderately deep and well drained. It formed in old eolian and alluvial material derived from mixed sources. Typically, less than 2 percent of the surface is covered with stones. The surface layer is pale brown stony silt loam 9 inches thick. The subsoil is dark yellowish brown clay 10 inches thick. The upper 4 inches of the substratum is very pale brown loam, and the lower part to a depth of 28 inches is a yellow, indurated hardpan. Basalt is at a depth of 28 inches.

Permeability of the Deunah soil is very slow. Available water capacity is moderate. Effective rooting depth is 20 to 34 inches, but penetration and distribution of roots are limited by the claypan above that depth. Runoff is medium, and the hazard of water erosion is slight. Water is perched above the very slowly permeable subsoil during rainy periods in spring.

The Hatpeak soil is moderately deep and well drained. It formed in old alluvium derived from mixed sources and is influenced by loess. Typically, the surface layer is brown silt loam 11 inches thick. The upper 5 inches of the subsoil is light yellowish brown silt loam, the next 8 inches is light yellowish brown silty clay loam, and the lower part to a depth of 34 inches is light yellowish brown clay. A very pale brown, indurated hardpan is at a depth of 34 inches. Basalt is at a depth of 41 inches.

Permeability of the Hatpeak soil is slow. Available water capacity is high. Effective rooting depth is 20 to 34 inches. Runoff is slow, and the hazard of water erosion is slight.

This unit is used for livestock grazing.

The potential plant community on the Petan soil is mainly low sagebrush and Idaho fescue. The potential plant community on the Deunah soil is mainly alkali sagebrush and Idaho fescue. The potential plant community on the Hatpeak soil is mainly basin big sagebrush, Idaho fescue, and bluebunch wheatgrass. If the range deteriorates, Idaho fescue and bluebunch wheatgrass decrease and are gradually replaced by less desirable annual and perennial grasses. Sagebrush generally increases.

This unit is suited to livestock grazing in spring. The main limitations are the stoniness of the Petan soil and wetness of the Deunah soil in spring. The Hatpeak soil has few limitations. The Deunah soil is shallow to a claypan. In spring the claypan swells upon wetting and restricts the downward movement of water. The surface then becomes saturated, and the soil is particularly susceptible to trampling and soil compaction. Compaction generally reduces the water intake, increases erosion, and ultimately reduces the productivity of the soil. Grazing should be delayed until the soil has drained sufficiently and is firm enough to withstand trampling by livestock. Mechanical seeding and brush control are limited by large stones on the surface of the Petan soil.

This map unit is in capability subclass VIIs.

27—Rubble land-Deunah complex, 1 to 6 percent slopes. This map unit is on side slopes of plateaus and tables. Elevation is 5,500 to 6,000 feet. The average annual precipitation is about 15 inches, the average annual air temperature is about 44 degrees F, and the average frost-free period is 70 to 90 days.

This unit is about 40 percent Rubble land, 1 to 6 percent slopes, on eroded side slopes and 35 percent Deunah stony silt loam, 1 to 4 percent slopes, on summits.

Included in this unit are small areas of a soil that has a thick loamy surface layer, is 20 to 40 inches deep to bedrock, and is on mounds; Wickahoney rubbly silt loam; and Rock outcrop that is scattered throughout areas of Rubble land.

Rubble land consists of areas that are covered with basalt stones. It supports little if any vegetation.

Commonly, the stones are underlain by a thin layer of clayey soil material over bedrock.

The Deunah soil is moderately deep and well drained. It formed in old eolian and alluvial material derived from mixed sources. Typically, less than 2 percent of the surface is covered with stones. The surface layer is pale brown stony silt loam 9 inches thick. The subsoil is dark yellowish brown clay 10 inches thick. The upper 4 inches of the substratum is very pale brown loam, and the lower part to a depth of 28 inches is a yellow, cemented hardpan. Basalt is at a depth of 28 inches.

Permeability of the Deunah soil is very slow. Available water capacity is moderate. Effective rooting depth is 20 to 34 inches, but penetration and distribution of roots are limited by the claypan above that depth. Runoff is medium, and the hazard of water erosion is slight. Water is perched above the very slowly permeable subsoil during rainy periods in spring.

This unit is used for livestock grazing.

Rubble land supports plants that are adapted to dry and extremely rocky areas. Such plants include rayless daisy, wallflower phoenicaulis, and biscuitroot. The production of these plants and their value as forage are very low. The potential plant community on the Deunah soil is mainly alkali sagebrush and Idaho fescue. If the potential plant community deteriorates, less preferred forage plants increase. Among the plants that increase are bottlebrush squirreltail, sagebrush, lupine, and phlox.

This unit is suited to livestock grazing in spring. The main limitations are wetness of the Deunah soil in spring and stoniness. Large stones on the surface of the soil limit movement of livestock. The Deunah soil is shallow to a claypan. In spring the claypan swells upon wetting and restricts the downward movement of water. The surface then becomes saturated, and the soil is particularly susceptible to trampling and soil compaction. Compaction generally reduces the water intake rate, increases erosion, and ultimately reduces the productivity of the soil. Grazing should be delayed until the soil has drained sufficiently and is firm enough to withstand trampling by livestock. Large stones on the surface of the soil limit mechanical seeding.

This map unit is in capability subclass VIIs.

28—Rubble land-Rock outcrop-Argixerolls complex, 25 to 95 percent slopes. This map unit is in canyons. Elevation is 5,190 to 7,000 feet. The average annual precipitation is 13 to 18 inches, the average annual air temperature is 40 to 45 degrees F, and the average frost-free period is 30 to 100 days.

This unit is about 40 percent Rubble land, 50 to 95 percent slopes, on talus side slopes; 25 percent Rock outcrop, 50 to 95 percent slopes, on rims and side slopes; and 25 percent Argixerolls, 25 to 50 percent slopes, on foot slopes. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Included in this unit are small areas of Hayspur clay loam and Riverwash on the canyon bottoms.

Rubble land consists of areas covered with basalt stones. It supports little if any vegetation. Commonly, the stones are underlain by a thin layer of clayey soil material over bedrock.

Rock outcrop is exposed areas of basalt that are along rims and ledges of the canyonsides. In some places the rock forms nearly vertical cliffs.

Argixerolls are shallow to very deep and are well drained. They formed in colluvium and alluvium derived dominantly from basalt. A reference profile has a surface layer of grayish brown and brown loam 11 inches thick. The upper 13 inches of the subsoil is light yellowish brown clay loam, the next 19 inches is light yellowish brown and pale brown sandy clay loam, and the lower part to a depth of 53 inches is pale brown sandy loam over a hardpan. Depth to the hardpan is 40 to 60 inches or more.

Permeability of these soils is moderate to slow. Available water capacity is very low to very high. Effective rooting depth is 10 inches or more. Runoff is rapid to very rapid, and the hazard of water erosion is very high.

This unit is used as wildlife habitat.

The vegetation on the Argixerolls is mainly basin big sagebrush, mountain big sagebrush, Idaho fescue, and bluebunch wheatgrass.

This map unit is in capability subclass VIIs.

29—Searla-Povey association, 30 to 60 percent slopes. This map unit is on mountainsides. Elevation is 5,500 to 6,800 feet. The average annual precipitation is 14 to 18 inches, the average annual air temperature is 41 to 43 degrees F, and the average frost-free period is 30 to 70 days.

This unit is about 40 percent Searla gravelly loam on south- and west-facing side slopes and 40 percent Povey gravelly loam on north- and east-facing side slopes.

Included in this unit are small areas of soils that are similar to the Searla soil but have bedrock within 40 inches of the surface and are on shoulder slopes or that do not have lime in the profile and are on south- and west-facing side slopes.

The Searla soil is very deep and well drained. It formed in colluvium derived dominantly from limestone, siltstone, and sandstone. Typically, the surface layer is brown gravelly loam 15 inches thick. The upper 17 inches of the subsoil is yellowish brown very gravelly clay loam, and the lower 4 inches is white, calcareous very gravelly loam. The substratum to a depth of 60 inches or more is light gray, calcareous very gravelly sandy loam.

Permeability of the Searla soil is moderately slow. Available water capacity is high. Effective rooting depth

is 60 inches or more. Runoff is very rapid, and the hazard of water erosion is very high.

The Povey soil is very deep and well drained. It formed in colluvium derived dominantly from limestone, siltstone, and sandstone. Typically, the surface layer is brown gravelly and very gravelly loam 21 inches thick. The upper 23 inches of the subsoil is brown very cobbly loam, and the lower 4 inches is white, calcareous very gravelly loam. The substratum to a depth of 60 inches or more is very pale brown, calcareous extremely cobbly loam.

Permeability of the Povey soil is moderate. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is very rapid, and the hazard of water erosion is very high.

This unit is used for livestock grazing.

The potential plant community on the Searla soil is mainly mountain big sagebrush and bluebunch wheatgrass. The potential plant community on the Povey soil is mainly mountain big sagebrush, mountain snowberry, and Idaho fescue. If the range deteriorates, Idaho fescue and bluebunch wheatgrass decrease and are gradually replaced by less desirable species such as cheatgrass.

This unit is suited to livestock grazing in summer. The main limitation is steepness of slope. Steepness of slope limits access by livestock and may result in overgrazing of less sloping areas. Placing salt on side slopes and in less intensively grazed areas encourages more uniform grazing. Areas on south-facing side slopes are more droughty than other areas. For this reason, pasture on south-facing side slopes is more likely to deteriorate because of overgrazing. Regenerating pasture can be difficult in the drier areas. Rangeland seeding by mechanical methods is also limited because of steepness of slope.

This map unit is in capability subclass VIIe.

30—Simonton sandy loam, 1 to 3 percent slopes. This very deep, well drained soil is on alluvial terraces. It formed in coarse-textured alluvium derived dominantly from basalt and rhyolite. Elevation is 5,300 to 5,320 feet. The average annual precipitation is about 15 inches, the average annual air temperature is about 44 degrees F, and the average frost-free period is 80 to 100 days.

Included in this unit are small areas of a soil that is similar to this Simonton soil but has less than 18 percent clay in the subsoil and is in slightly higher, convex areas; Thacker loam; and a soil that is similar to the Simonton soil but has more than 35 percent clay in the subsoil and is on side slopes. Also included are small areas of Bluecreek sandy loam and Paynecreek Variant loam scattered throughout the unit and small areas of soils that have slopes of 3 to 6 percent. Included areas make up about 20 percent of the total acreage.

Typically, the surface layer is grayish brown sandy loam 12 inches thick. The upper 6 inches of the subsoil is grayish brown sandy loam, the next 12 inches is pale brown sandy clay loam, and the lower part to a depth of 35 inches is pale brown sandy loam. The upper 14 inches of the substratum is pale brown loamy sand, and the lower part to a depth of 84 inches or more is white loam.

Permeability of this Simonton soil is moderate to a depth of 35 inches and rapid below this depth. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing is high.

This unit is used for livestock grazing.

The potential plant community on this unit is mainly basin big sagebrush, Idaho fescue, and bluebunch wheatgrass. If the range deteriorates, Idaho fescue and bluebunch wheatgrass decrease and are gradually replaced by cheatgrass and bottlebrush squirreltail. Sagebrush and rabbitbrush generally increase.

This unit is suited to livestock grazing in spring and fall. It has only minor limitations. Availability of water for livestock may be a concern in fall. The unit is suited to brush control by chemicals.

This unit is suited to irrigated cultivated crops. It is limited mainly by the hazard of soil blowing. Soil blowing can be reduced by returning crop residue to the soil and practicing minimum tillage. Sprinkler irrigation is a suitable method of applying water.

This unit has potential for the production of nonirrigated winter wheat.

This map unit is in capability subclass IIIs, irrigated and nonirrigated.

31—Simonton-Bluecreek complex, 1 to 4 percent slopes. This map unit is on alluvial terraces. Elevation is 5,300 to 5,315 feet. The average annual precipitation is about 15 inches, the average annual air temperature is about 44 degrees F, and the average frost-free period is 80 to 100 days.

This unit is about 55 percent Simonton sandy loam on the higher terrace tops and in convex areas and 30 percent Bluecreek sandy loam in depressional areas, old channels, and swales. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Included in this unit are small areas of a soil that is similar to the Simonton soil but has less than 18 percent clay in the subsoil and is in the slightly higher, convex areas; Thacker loam; a soil that is similar to the Bluecreek soil but does not have a hardpan and is on side slopes; and Disabel Variant silt loam and Bluecreek Variant silt loam in drainageways. Also included are small areas of soils that have slopes of 4 to 8 percent.

The Simonton soil is very deep and well drained. It formed in coarse-textured alluvium derived dominantly from rhyolite and basalt. Typically, the surface layer is grayish brown sandy loam 12 inches thick. The upper 6 inches of the subsoil is grayish brown sandy loam, the

next 12 inches is pale brown sandy clay loam, and the lower part to a depth of 35 inches is pale brown sandy loam. The upper 14 inches of the substratum is pale brown loamy sand, and the lower part to a depth of 84 inches or more is white loam.

Permeability of the Simonton soil is moderate to a depth of 35 inches and rapid below this depth. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing is high.

The Bluecreek soil is moderately deep and well drained. It formed in alluvium derived dominantly from rhyolite and basalt. Typically, the surface layer is pale brown sandy loam 6 inches thick. The upper 5 inches of the subsoil is pale brown sandy loam, the next 9 inches is light yellowish brown clay loam, and the lower part to a depth of 26 inches is pale brown gravelly sandy loam. Below this is a grayish brown, indurated hardpan 3 inches thick. The upper 10 inches of the substratum is gray very gravelly sand, the next part is a grayish brown, indurated hardpan 5 inches thick, and the lower part to a depth of 84 inches or more is gray very gravelly sand.

Permeability of the Bluecreek soil is slow. Available water capacity is low. Effective rooting depth is 20 to 40 inches. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing is high.

This unit is used for livestock grazing.

The potential plant community on the Simonton and Bluecreek soils is mainly basin big sagebrush, Idaho fescue, and bluebunch wheatgrass. If the range deteriorates, Idaho fescue and bluebunch wheatgrass decrease and are gradually replaced by cheatgrass and bottlebrush squirreltail. Sagebrush and rabbitbrush generally increase.

This unit is suited to livestock grazing in spring and fall. It has only minor limitations. Availability of water for livestock may be a concern in fall. The unit is suited to brush control by chemicals.

This unit is suited to irrigated cultivated crops. It is limited mainly by the hazard of soil blowing. Soil blowing can be reduced by returning crop residue to the soil and practicing minimum tillage. Erosion can be controlled by maintaining crop residue on the surface and by properly applying irrigation water. Sprinkler irrigation is a suitable method of applying water.

This map unit is in capability subclasses IIIe, irrigated, and IVe, nonirrigated.

32—Simonton-Thacker, dry complex, 1 to 4 percent slopes. This map unit is on alluvial terraces. Elevation is 5,300 to 5,340 feet. The average annual precipitation is about 15 inches, the average annual air temperature is about 44 degrees F, and the average frost-free period is 80 to 100 days.

This unit is about 45 percent Simonton coarse sandy loam in the lower lying areas and in drainageways and 35 percent Thacker loam, dry, in convex areas and in the higher lying areas. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Included in this unit are small areas of a soil that is similar to this Simonton soil but has a claypan and small areas of Thacker loam. These soils are scattered throughout the unit. Also included are small areas of soils that have slopes of 4 to 6 percent.

The Simonton soil is very deep and well drained. It formed in coarse-textured alluvium derived dominantly from granite and rhyolite. Typically, the surface layer is grayish brown and brown coarse sandy loam 15 inches thick. The upper 8 inches of the subsoil is pale brown gravelly coarse sandy loam, the next 11 inches is yellowish brown gravelly sandy clay loam, and the lower part to a depth of 41 inches is yellowish brown gravelly coarse sandy loam. The upper 39 inches of the substratum is variegated very gravelly loamy coarse sand, and the lower part to a depth of 84 inches or more is variegated loam.

Permeability of the Simonton soil is moderate to a depth of 41 inches and rapid below this depth. Available water capacity is moderate to high. Effective rooting depth is 60 inches or more. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing is high.

The Thacker soil is moderately deep and well drained. It formed in alluvium derived from mixed sources. Typically, the upper 4 inches of the surface layer is pale brown loam and the lower 8 inches is pale brown gravelly loam. The subsoil is dark yellowish brown clay 9 inches thick. A light yellowish brown, indurated hardpan is at a depth of 21 inches. The upper 13 inches of the substratum is light yellowish brown, slightly cemented extremely gravelly sand, and the lower part to a depth of 84 inches or more is strata of gravelly sand and sand.

Permeability of the Thacker soil is very slow. Available water capacity is low to moderate. Effective rooting depth is 20 to 40 inches, but penetration and distribution of roots are limited by the claypan above that depth. Runoff is medium, and the hazard of water erosion is slight. Water is perched above the very slowly permeable subsoil during rainy periods in spring.

This unit is used mainly for livestock grazing. It is also used as irrigated cropland and homesites.

The potential plant community on the Simonton soil is mainly basin big sagebrush, Idaho fescue, and bluebunch wheatgrass. The potential plant community on the Thacker soil is mainly stunted basin big sagebrush, Idaho fescue, and bluebunch wheatgrass. If the range deteriorates, Idaho fescue and bluebunch wheatgrass decrease and are gradually replaced by less desirable annual and perennial grasses such as cheatgrass and bottlebrush squirreltail. Basin big sagebrush and rabbitbrush generally increase.

This unit is suited to livestock grazing in spring and fall. It has only minor limitations. Availability of water for livestock may be a concern in fall.

This unit is poorly suited to irrigated cultivated crops. It is limited mainly by the shallow depth to a claypan in the Thacker soil. The claypan restricts the growth of roots and the movement of water through the profile. Subsoiling opens up this claypan and allows water and roots to pass through. Moldboard plowing may bring the claypan to the surface; therefore, field preparations such as subsoiling and disking are better suited to this soil. Soil blowing can be controlled by keeping the soil rough and cloddy when it is not protected by vegetation.

Sprinkler irrigation is a suitable method of applying water. Because of the very slow permeability of the Thacker soil, applications of irrigation water should be light and frequent.

This unit has some limitations for homesite development. Excavation for building sites on the Thacker soil is difficult because of the hardpan. Septic tank absorption fields on this soil can be expected to function poorly. The very slowly permeable subsoil and the hardpan severely limit percolation of effluent. In addition, the very rapidly permeable substratum is a poor filter. The rapidly permeable substratum of the Simonton soil is also a poor filter of effluent. Community sewage systems may be needed to properly dispose of household wastes.

This map unit is in capability subclass IVe, irrigated and nonirrigated.

33—Simonton-Thacker, dry complex, 4 to 10 percent slopes. This map unit is on alluvial terraces. Elevation is 5,300 to 5,340 feet. The average annual precipitation is about 15 inches, the average annual air temperature is about 44 degrees F, and the average frost-free period is 80 to 100 days.

This unit is about 45 percent Simonton coarse sandy loam on the lower side slopes and in drainageways and 35 percent Thacker loam, dry, on convex side slopes and ridgetops. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Included in this unit are small areas of a soil that is similar to the Simonton soil but has a claypan and small areas of Thacker loam. Both soils are scattered throughout the unit. Also included are small areas of soils that have slopes of 1 to 4 percent or 10 to 16 percent.

The Simonton soil is very deep and well drained. It formed in coarse-textured alluvium derived dominantly from granite and rhyolite. Typically, the surface layer is grayish brown and brown coarse sandy loam 15 inches thick. The upper 8 inches of the subsoil is pale brown gravelly coarse sandy loam, the next 11 inches is yellowish brown gravelly sandy clay loam, and the lower part to a depth of 41 inches is yellowish brown gravelly coarse sandy loam. The upper 39 inches of the substratum is variegated very gravelly loamy coarse sand, and the lower part to a depth of 84 inches or more is variegated loam.

Permeability of the Simonton soil is moderate to a depth of 41 inches and rapid below this depth. Available water capacity is moderate to high. Effective rooting depth is 60 inches or more. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing is high.

The Thacker soil is moderately deep and well drained. It formed in alluvium derived from mixed sources. Typically, the upper 4 inches of the surface layer is pale brown loam and the lower 8 inches is pale brown gravelly loam. The subsoil is dark yellowish brown clay 9 inches thick. A light yellowish brown, indurated hardpan is at a depth of 21 inches. The upper 13 inches of the substratum is light yellowish brown, slightly cemented extremely gravelly sand, and the lower part to a depth of 84 inches or more is strata of gravelly sand and sand.

Permeability of the Thacker soil is very slow. Available water capacity is low to moderate. Effective rooting depth is 20 to 40 inches, but penetration and distribution of roots are limited by the claypan above that depth. Runoff is rapid, and the hazard of water erosion is moderate. Water is perched above the very slowly permeable subsoil during rainy periods in spring.

This unit is used mainly for livestock grazing. It is also used as irrigated cropland.

The potential plant community on the Simonton soil is mainly basin big sagebrush, Idaho fescue, and bluebunch wheatgrass. The potential plant community on the Thacker soil is mainly stunted basin big sagebrush, Idaho fescue, and bluebunch wheatgrass. If the range deteriorates, Idaho fescue and bluebunch wheatgrass decrease and are gradually replaced by less desirable annual and perennial grasses such as cheatgrass and bottlebrush squirreltail. Basin big sagebrush and rabbitbrush generally increase.

This unit is suited to livestock grazing in spring and fall. It has only minor limitations. Availability of water for livestock may be a concern in fall.

This unit is poorly suited to irrigated cultivated crops. It is limited mainly by the hazard of erosion and the shallow depth to a claypan in the Thacker soil. To help control erosion, all tillage should be on the contour or across the slope. The flow of runoff in drainageways can be reduced by the use of grassed waterways. The claypan in the Thacker soil restricts the growth of roots and the movement of water through the profile. Subsoiling opens up this claypan and allows water and roots to pass through. Moldboard plowing may bring the claypan to the surface; therefore, field preparations such as subsoiling and disking are better suited to this unit. Soil blowing can be controlled by keeping the soil rough and cloddy when it is not protected by vegetation.

Sprinkler irrigation is a suitable method of applying water. Because of the very slow permeability of the Thacker soil, applications of irrigation water should be light and frequent.

This map unit is in capability subclass IVe, irrigated and nonirrigated.

34—Soonahbe silt loam, 1 to 3 percent slopes. This deep, well drained soil is on alluvial terraces and fan piedmonts. It formed in loess and loamy alluvium derived from mixed sources. Elevation is 5,340 to 5,400 feet. The average annual precipitation is about 15 inches, the average annual air temperature is about 44 degrees F, and the average frost-free period is 80 to 100 days.

Included in this unit are small areas of Thacker loam in eroded areas near drainageways and soils that are similar to this Soonahbe soil but have a dark colored surface layer and a subsoil of loam. Also included are small areas of soils that have slopes of 3 to 6 percent. Included areas make up about 20 percent of the total acreage.

Typically, the surface layer is pale brown silt loam 6 inches thick. The upper 8 inches of the subsoil is yellowish brown loam, the next 10 inches is light yellowish brown clay loam, and the lower part to a depth of 31 inches is light yellowish brown loam. The upper 15 inches of the substratum is very pale brown silt loam, the next 13 inches is a very pale brown, indurated hardpan, and the lower part to a depth of 80 inches is very pale brown silt loam. Below this to a depth of 84 inches or more is gravelly coarse sand.

Permeability of this Soonahbe soil is moderately slow. Available water capacity is very high. Effective rooting depth is 42 to 52 inches. Runoff is slow, and the hazard of water erosion is slight.

This unit is used mainly for irrigated hay and small grain. It is also used for livestock grazing.

This unit is suited to irrigated cultivated crops. It is limited mainly by the hazard of erosion. Erosion can be controlled by leaving crop residue on the surface and by properly applying irrigation water. Sprinkler irrigation is a suitable method of applying water.

This unit has potential for the production of nonirrigated winter wheat.

The potential plant community on this unit is mainly basin big sagebrush, Idaho fescue, and bluebunch wheatgrass. If the range deteriorates, Idaho fescue and bluebunch wheatgrass decrease and are gradually replaced by cheatgrass and bottlebrush squirreltail. Sagebrush and rabbitbrush generally increase.

This unit is suited to livestock grazing in spring and fall. It has only minor limitations. Availability of water for livestock may be a concern in fall. The unit is suited to brush control by chemicals.

This map unit is in capability subclasses IIIe, irrigated, and IIIc, nonirrigated.

35—Soonahbe-Thacker, dry complex, 1 to 4 percent slopes. This map unit is on alluvial terraces and fan piedmonts. Elevation is 5,300 to 5,470 feet. The average annual precipitation is about 15 inches, the average annual air temperature is about 44 degrees F, and the average frost-free period is 80 to 100 days.

This unit is about 45 percent Soonahbe silt loam on mounds and in uneroded areas and 45 percent Thacker loam, dry, in drainageways and eroded areas. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Included in this unit are small areas of Paynecreek gravelly loam, 3 to 5 percent slopes, on the sides of drainageways and small areas of a soil that is similar to the Thacker soil but has a high percentage of sodium in the subsoil and is scattered throughout the unit. Also included are small areas of soils that have slopes of 4 to 6 percent.

The Soonahbe soil is deep and well drained. It formed in loess and loamy alluvium derived from mixed sources. Typically, the surface layer is pale brown silt loam 6 inches thick. The upper 8 inches of the subsoil is yellowish brown loam, the next 10 inches is light yellowish brown clay loam, and the lower part to a depth of 31 inches is light yellowish brown loam. The upper 15 inches of the substratum is very pale brown silt loam, the next 13 inches is a very pale brown, indurated hardpan, and the lower part to a depth of 80 inches or more very pale brown silt loam. Below this to a depth of 84 inches or more is gravelly coarse sand.

Permeability of the Soonahbe soil is moderately slow. Available water capacity is very high. Effective rooting depth is 42 to 52 inches. Runoff is slow, and the hazard of water erosion is slight.

The Thacker soil is moderately deep and well drained. It formed in alluvium derived from mixed sources. Typically, the upper 4 inches of the surface layer is pale brown loam and the lower 8 inches is pale brown gravelly loam. The subsoil is dark yellowish brown clay 9 inches thick. A light yellowish brown, indurated hardpan is at a depth of 21 inches. The upper 13 inches of the substratum is light yellowish brown, slightly cemented extremely gravelly sand, and the lower part to a depth of 84 inches or more is strata of gravelly sand and sand.

Permeability of the Thacker soil is very slow. Available water capacity is low to moderate. Effective rooting depth is 20 to 40 inches, but penetration and distribution of roots are limited by the claypan above that depth. Runoff is medium, and the hazard of water erosion is slight. Water is perched above the very slowly permeable subsoil during rainy periods in spring.

Most areas of this unit are used for livestock grazing. A few areas are used as irrigated cropland.

The potential plant community on the Soonahbe soil is mainly basin big sagebrush, Idaho fescue, and bluebunch wheatgrass. The potential plant community on

the Thacker soil is mainly stunted basin big sagebrush, Idaho fescue, and bluebunch wheatgrass. If the range deteriorates, Idaho fescue and bluebunch wheatgrass decrease and are gradually replaced by less desirable annual and perennial grasses such as cheatgrass and bottlebrush squirreltail. Basin big sagebrush and rabbitbrush generally increase.

This unit is suited to livestock grazing in spring and fall. It has only minor limitations. Availability of water for livestock may be a concern in fall.

This unit is poorly suited to irrigated cultivated crops. It is limited mainly by the shallow depth to a claypan in the Thacker soil. The claypan restricts the growth of roots and the movement of water through the profile. Subsoiling opens up this claypan and allows water and roots to pass through. Moldboard plowing may bring the claypan to the surface; therefore, field preparations such as subsoiling and disking are better suited to this soil.

Sprinkler irrigation is a suitable method of applying water. Because of the very slow permeability of the Thacker soil, applications of irrigation water should be light and frequent.

This map unit is in capability subclass IVe, irrigated and nonirrigated.

36—Soonahbe Variant-Bulake complex, 2 to 15 percent slopes. This map unit is on hillsides. Elevation is 5,380 to 5,500 feet. The average annual precipitation is 13 to 16 inches, the average annual air temperature is 43 to 45 degrees F, and the average frost-free period is 70 to 100 days.

This unit is about 45 percent Soonahbe Variant fine sandy loam, 2 to 15 percent slopes, and 35 percent Bulake fine sandy loam, 2 to 8 percent slopes. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Included in this unit are small areas of Rock outcrop on eroded side slopes, hill summits, and ridges; soils that are similar to the Soonahbe Variant and Bulake soils but have more than 35 percent rock fragments in the subsoil and are near areas of Rock outcrop; Zola loam; Paynecreek gravelly loam; and soils that have more than 35 percent rock fragments in the subsoil and are in and near drainageways. Also included are small areas of stabilized sand deposits.

The Soonahbe Variant soil is moderately deep and well drained. It formed in material derived dominantly from rhyolitic tuff and influenced by mixed alluvium. Typically, the upper 3 inches of the surface layer is pale brown fine sandy loam and the lower 5 inches is light yellowish brown loam. The upper 13 inches of the subsoil is light yellowish brown loam, and the lower 7 inches is very pale brown gravelly sandy loam. Ryholitic tuff is at a depth of 28 inches.

Permeability of the Soonahbe Variant soil is moderate. Available water capacity is moderate. Effective rooting depth is 20 to 40 inches. Runoff is rapid, and the hazard of water erosion is high. The hazard of soil blowing is high.

The Bulake soil is shallow and well drained. It formed in material derived dominantly from weathered rhyolitic tuff. Typically, the upper 2 inches of the surface layer is pale brown fine sandy loam and the lower 4 inches is pale brown loam. The upper 2 inches of the subsoil is light yellowish brown loam, and the lower 7 inches is very pale brown clay. The substratum is loosely consolidated rhyolitic tuff 5 inches thick over tuff.

Permeability of the Bulake soil is slow. Available water capacity is low. Effective rooting depth is 14 to 20 inches, but penetration and distribution of roots are limited by the claypan above that depth. Runoff is rapid, and the hazard of water erosion is moderate. The hazard of soil blowing is high.

This unit is used for livestock grazing.

The potential plant community on the Soonahbe Variant soil is mainly basin big sagebrush, Idaho fescue, and bluebunch wheatgrass. The potential plant community on the Bulake soil is mainly low sagebrush and Idaho fescue. If the range deteriorates, Idaho fescue and bluebunch wheatgrass decrease and are gradually replaced by cheatgrass and other less desirable forage plants. Sagebrush generally increases.

This unit is suited to livestock grazing in spring and summer. The Soonahbe Variant soil has few limitations for livestock grazing, mechanical seeding, and brush control. The main limitation of the Bulake soil is droughtiness. Plant growth is limited mainly by the low available water capacity of the soil. Limitations for rangeland seeding are moderate to severe on the Bulake soil.

This map unit is in capability subclass VIe, nonirrigated.

37—Strickland-Bluebell complex, 2 to 20 percent slopes. This map unit is on plateaus. Elevation is 6,500 to 7,500 feet. The average annual precipitation is about 20 inches, the average annual air temperature is about 40 degrees F, and the average frost-free period is 20 to 50 days.

This unit is about 40 percent Strickland loam, 2 to 20 percent slopes, in concave areas and 35 percent Bluebell loam, 5 to 20 percent slopes, on convex hilltops and shoulder slopes. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Included in this unit are small areas of a soil that is similar to the Bluebell soil but is shallow to bedrock, Rock outcrop and Rubble land on ridges and hilltops, and a soil that is similar to the Strickland soil but is deep and poorly drained and is in drainageways. Also included are small areas of soils that have a very stony surface.

The Strickland soil is moderately deep and well drained. It formed in slope alluvium derived dominantly

from basalt and tuff. Typically, the surface layer is yellowish brown loam 13 inches thick. The subsoil is brown loam 15 inches thick. Bedrock is at a depth of 28 inches.

Permeability of the Strickland soil is moderate. Available water capacity is moderate. Effective rooting depth is 20 to 40 inches. Runoff is rapid, and the hazard of water erosion is high.

The Bluebell soil is moderately deep and well drained. It formed in slope alluvium derived dominantly from basalt and tuff. Typically, the surface is covered with a layer of partially decomposed leaf litter 1 inch thick. The surface layer is very dark grayish brown and dark brown loam 17 inches thick. The upper 5 inches of the subsoil is dark brown loam, and the lower 7 inches is dark brown very stony clay loam. Fractured tuff is at a depth of 29 inches.

Permeability of the Bluebell soil is moderately slow. Available water capacity is low. Effective rooting depth is 20 to 40 inches. Runoff is rapid, and the hazard of water erosion is high.

This unit is used for livestock grazing.

The potential plant community on the Strickland soil is mainly mountain big sagebrush and mountain snowberry. The potential plant community on the Bluebell soil is mainly snowbrush ceanothus. The included poorly drained soils in this unit are in areas of wet and semiwet meadows. The potential plant community in these areas is mainly tufted hairgrass, slender wheatgrass, sedges, rushes, cinquefoil, and other meadow plants.

This unit is suited to livestock grazing in summer. The main limitation is wetness of the meadows in spring. The Strickland and Bluebell soils have limited value for livestock grazing because of the relatively minor amounts of grasses and forbs they produce. Numerous beaver dams cause flooding in drainageways.

The Strickland and Bluebell soils provide good habitat for deer.

This map unit is in capability subclass VIe.

38—Thacker loam, 1 to 4 percent slopes. This moderately deep, well drained soil is on alluvial terraces and piedmonts. It formed in alluvium derived from mixed sources. Elevation is 5,300 to 5,500 feet. The average annual precipitation is about 15 inches, the average annual air temperature is about 44 degrees F, and the average frost-free period is 80 to 100 days.

Included in this unit are small areas of Simonton coarse sandy loam and Soonahbe silt loam on mounds and ridgetops, Zola loam in drainageways, and a soil that is similar to this Thacker soil but has a high content of sodium in the subsoil and is near drainageways. Also included are small areas of soils that have slopes of 4 to 6 percent. Included areas make up about 20 percent of the total acreage.

Typically, the upper 4 inches of the surface layer is pale brown loam and the lower 8 inches is pale brown gravelly loam. The subsoil is dark yellowish brown clay 9 inches thick. A light yellowish brown, indurated hardpan is at a depth of 21 inches. The upper 13 inches of the substratum is light yellowish brown, slightly cemented extremely gravelly sand, and the lower part to a depth of 84 inches or more is strata of gravelly sand and sand.

Permeability of the Thacker soil is very slow. Available water capacity is low to moderate. Effective rooting depth is 20 to 40 inches, but penetration and distribution of roots are limited by the claypan above that depth. Runoff is medium, and the hazard of water erosion is slight. Water is perched above the very slowly permeable subsoil during rainy periods in spring.

This unit is used for livestock grazing.

The potential plant community on this unit is mainly low sagebrush and Idaho fescue. If the potential plant community deteriorates, less preferred forage plants increase. Among the plants that increase are low sagebrush, bottlebrush squirreltail, and annual grasses and forbs.

This unit is suited to livestock grazing in spring and fall. The main limitation is wetness in spring. The soil is shallow to a claypan. In spring the claypan swells upon wetting and restricts the downward movement of water. The surface then becomes saturated, and the soil is particularly susceptible to trampling and soil compaction. Compaction generally reduces the water intake rate, increases erosion, and ultimately reduces the productivity of the soil. Grazing should be delayed until the soil has drained sufficiently and is firm enough to withstand trampling by livestock. Availability of water for livestock may be a concern in fall. This unit is suited to brush control by chemicals.

This unit is poorly suited to irrigated cultivated crops. It is limited mainly by the shallow depth to the claypan.

This map unit is in capability subclass IVe, irrigated and nonirrigated.

39—Thacker very stony loam, 2 to 10 percent slopes. This moderately deep, well drained soil is on piedmonts. It formed in alluvium derived from mixed sources. Elevation is 5,350 to 5,600 feet. The average annual precipitation is about 15 inches, the average annual air temperature is about 44 degrees F, and the average frost-free period is 80 to 100 days.

Included in this unit are small areas of Cavanaugh very stony loam on the steeper side slopes, Zola loam in drainageways, and Simonton coarse sandy loam on mounds and ridgetops. Included areas make up about 20 percent of the total acreage.

Typically, 3 to 15 percent of the surface is covered with stones. The upper 4 inches of the surface layer is pale brown very stony loam, and the lower 8 inches is pale brown gravelly loam. The subsoil is dark yellowish brown clay 9 inches thick. A light yellowish brown, indurated hardpan is at a depth of 21 inches. The upper 13 inches of the substratum is light yellowish brown,

slightly cemented extremely gravelly sand, and the lower part to a depth of 84 inches or more is strata of gravelly sand and sand.

Permeability of the Thacker soil is very slow. Available water capacity is low to moderate. Effective rooting depth is 20 to 40 inches, but penetration and distribution of roots are limited by the claypan above that depth. Runoff is rapid, and the hazard of water erosion is high. Water is perched above the very slowly permeable subsoil during rainy periods in spring.

This unit is used for livestock grazing.

The potential plant community on this unit is mainly low sagebrush and Idaho fescue. If the potential plant community deteriorates, less preferred forage plants increase. Among the plants that increase because of overgrazing are low sagebrush, bottlebrush squirreltail, and annual grasses and forbs.

This unit is suited to livestock grazing in spring and fall. The main limitation for grazing, mechanical seeding, and brush control is stoniness.

This unit is very poorly suited to irrigated cultivated crops. It is limited mainly by stoniness, the hazard of erosion, and the shallow depth to a claypan.

This map unit is in capability subclass VIe, irrigated and nonirrigated.

40—Thacker-Simonton complex, 1 to 4 percent slopes. This map unit is on alluvial terraces. Elevation is 5,300 to 5,340 feet. The average annual precipitation is about 15 inches, the average annual air temperature is about 44 degrees F, and the average frost-free period is 80 to 100 days.

This unit is about 45 percent Thacker loam in drainageways and in eroded areas and 35 percent Simonton coarse sandy loam in uneroded areas. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Included in this unit are small areas of Bluecreek sandy loam and Thacker loam, dry, scattered throughout the unit. Also included are small areas of soils that have slopes of 4 to 6 percent.

The Thacker soil is moderately deep and well drained. It formed in alluvium derived from mixed sources. Typically, the upper 4 inches of the surface layer is pale brown loam and the lower 8 inches is pale brown gravelly loam. The subsoil is dark yellowish brown clay 9 inches thick. A light yellowish brown, indurated hardpan is at a depth of 21 inches. The upper 13 inches of the substratum is light yellowish brown, slightly cemented extremely gravelly sand, and the lower part to a depth of 84 inches or more is strata of gravelly sand and sand.

Permeability of the Thacker soil is very slow. Available water capacity is low to moderate. Effective rooting depth is 20 to 40 inches, but penetration and distribution of roots are limited by the claypan above that depth. Runoff is medium, and the hazard of water erosion is slight. Water is perched above the very slowly permeable subsoil during rainy periods in spring.

The Simonton soil is very deep and well drained. It formed in coarse-textured alluvium derived dominantly from granite and rhyolite. Typically, the surface layer is grayish brown and brown coarse sandy loam 15 inches thick. The upper 8 inches of the subsoil is pale brown gravelly coarse sandy loam, the next 11 inches is yellowish brown gravelly sandy clay loam, and the lower part to a depth of 41 inches is yellowish brown gravelly coarse sandy loam. The upper 39 inches of the substratum is variegated very gravelly loamy coarse sand, and the lower part to a depth of 84 inches or more is variegated loam.

Permeability of the Simonton soil is moderate to a depth of 41 inches and rapid below this depth. Available water capacity is moderate to high. Effective rooting depth is 60 inches or more. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing is high.

This unit is used mainly for livestock grazing. It is also used as irrigated cropland and homesites.

The potential plant community on the Thacker soil is mainly low sagebrush and Idaho fescue. The potential plant community on the Simonton soil is mainly basin big sagebrush, Idaho fescue, and bluebunch wheatgrass. If the range deteriorates, Idaho fescue and bluebunch wheatgrass decrease and are gradually replaced by less desirable annual and perennial grasses such as cheatgrass and bottlebrush squirreltail. Basin big sagebrush and low sagebrush generally increase.

This unit is suited to livestock grazing in spring and fall. The main limitation is wetness in spring. The Thacker soil is shallow to a claypan. In spring the claypan swells upon wetting and restricts the downward movement of water. The surface then becomes saturated, and the soil is particularly susceptible to trampling and compaction. Compaction generally reduces the water intake rate, increases erosion, and ultimately reduces the productivity of the soil. Grazing should be delayed until the soil has drained sufficiently and is firm enough to withstand trampling by livestock. Availability of water for livestock may be a concern in fall. This unit is suited to brush control by chemicals.

This unit is poorly suited to irrigated cultivated crops. It is limited mainly by the shallow depth to a claypan in the Thacker soil. The claypan restricts the growth of roots and the movement of water through the profile. Subsoiling opens up this claypan and allows water and roots to pass through. Moldboard plowing may bring the claypan to the surface; therefore, field preparations such as subsoiling and disking are better suited to this soil. Soil blowing can be controlled by keeping the soil rough and cloddy when it is not protected by vegetation.

Sprinkler irrigation is a suitable method of applying water. Because of the very slow permeability of the

Thacker soil, applications of irrigation water should be light and frequent.

This unit has some limitations for homesite development. Excavation for building sites on the Thacker soil is difficult because of the hardpan. Septic tank absorption fields on the Thacker soil can be expected to function poorly. The very slowly permeable subsoil and the hardpan severely limit percolation of effluent. In addition, the very rapidly permeable substratum is a poor filter. The rapidly permeable substratum of the Simonton soil is also a poor filter of effluent. Community sewage systems may be needed to properly dispose of household wastes.

This map unit is in capability subclass IVe, irrigated and nonirrigated.

41—Thacker-Simonton complex, 4 to 10 percent slopes. This map unit is on alluvial terraces. Elevation is 5,300 to 5,340 feet. The average annual precipitation is about 15 inches, the average annual air temperature is about 44 degrees F, and the average frost-free period is 80 to 100 days.

This unit is about 50 percent Thacker loam in draws and on the lower side slopes and 30 percent Simonton coarse sandy loam on the upper side slopes and on ridgetops. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Included in this unit are small areas of Zola loam in drainageways and a soil that is similar to the Thacker soil but has a high content of sodium in the subsoil and is near drainageways. Also included are small areas of soils that have slopes of 1 to 4 percent or 10 to 16 percent.

The Thacker soil is moderately deep and well drained. It formed in alluvium derived from mixed sources. Typically, the upper 4 inches of the surface layer is pale brown loam and the lower 8 inches is pale brown gravelly loam. The subsoil is dark yellowish brown clay 9 inches thick. A light yellowish brown, indurated hardpan is at a depth of 21 inches. The upper 13 inches of the substratum is light yellowish brown, slightly cemented extremely gravelly sand, and the lower part to a depth of 84 inches or more is strata of gravelly sand and sand.

Permeability of the Thacker soil is very slow. Available water capacity is low to moderate. Effective rooting depth is 20 to 40 inches, but penetration and distribution of roots are limited by the claypan above that depth. Runoff is rapid, and the hazard of water erosion is moderate. Water is perched above the very slowly permeable subsoil during rainy periods in spring.

The Simonton soil is very deep and well drained. It formed in coarse-textured alluvium derived dominantly from granite and rhyolite. Typically, the surface layer is grayish brown and brown coarse sandy loam 15 inches thick. The upper 8 inches of the subsoil is pale brown gravelly coarse sandy loam, the next 11 inches is yellowish brown gravelly sandy clay loam, and the lower part to a depth of 41 inches is yellowish brown gravelly coarse sandy loam. The upper 39 inches of the substratum is variegated very gravelly loamy coarse sand, and the lower part to a depth of 84 inches or more is variegated loam.

Permeability of the Simonton soil is moderate to a depth of 41 inches and rapid below this depth. Available water capacity is moderate to high. Effective rooting depth is 60 inches or more. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing is high.

This unit is used mainly for livestock grazing. It is also used as irrigated cropland.

The potential plant community on the Thacker soil is mainly low sagebrush and Idaho fescue. The potential plant community on the Simonton soil is mainly basin big sagebrush, Idaho fescue, and bluebunch wheatgrass. If the range deteriorates, Idaho fescue and bluebunch wheatgrass decrease and are gradually replaced by cheatgrass and bottlebrush squirreltail. Low sagebrush and basin big sagebrush generally increase.

This unit is suited to livestock grazing in spring and fall. The main limitation is wetness in spring. The Thacker soil is shallow to a claypan. In spring the claypan swells upon wetting and restricts the downward movement of water. The surface then becomes saturated, and the soil is particularly susceptible to trampling and compaction. Compaction generally reduces the water intake rate, increases erosion, and ultimately reduces the productivity of the soil. Grazing should be delayed until the soil has drained sufficiently and is firm enough to withstand trampling by livestock. Availability of water for livestock may be a concern in fall. This unit is suited to brush control by chemicals.

This unit is poorly suited to irrigated cultivated crops. It is limited mainly by the hazard of erosion and the shallow depth to a claypan in the Thacker soil. To help control erosion, all tillage should be on the contour or across the slope. The flow of runoff in drainageways can be reduced by the use of grassed waterways. The claypan of the Thacker soil restricts the growth of roots and movement of water through the profile. Subsoiling opens up this claypan and allows water and roots to pass through. Moldboard plowing may bring the claypan to the surface; therefore, field preparations such as subsoiling and disking are better suited to this soil. Soil blowing can be controlled by keeping the soil rough and cloddy when it is not protected by vegetation.

Sprinkler irrigation is a suitable method of applying water. Because of the very slow permeability of the Thacker soil, applications of irrigation water should be light and frequent.

This map unit is in capability subclass IVe, irrigated and nonirrigated.

42—Thacker-Soonahbe complex, 4 to 10 percent slopes. This map unit is on dissected alluvial terraces. Elevation is 5,300 to 5,410 feet. The average annual precipitation is about 15 inches, the average annual air temperature is about 44 degrees F, and the average frost-free period is 80 to 100 days.

This unit is about 60 percent Thacker loam on convex side slopes and in drainageways and 30 percent Soonahbe silt loam on mounds and smooth upper side slopes. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Included in this unit are small areas of Paynecreek gravelly loam on the steeper side slopes and small areas of Thacker loam, dry, that are scattered throughout the unit. Also included are small areas of soils that have slopes of 1 to 4 percent or 10 to 16 percent.

The Thacker soil is moderately deep and well drained. It formed in alluvium derived from mixed sources. Typically, the upper 4 inches of the surface layer is pale brown loam and the lower 8 inches is pale brown gravelly loam. The subsoil is dark yellowish brown clay 9 inches thick. A light yellowish brown, indurated hardpan is at a depth of 21 inches. The upper 13 inches of the substratum is light yellowish brown, slightly cemented extremely gravelly sand, and the lower part to a depth of 84 inches or more is strata of gravelly sand and sand.

Permeability of the Thacker soil is very slow. Available water capacity is low to moderate. Effective rooting depth is 20 to 40 inches, but penetration and distribution of roots are limited by the claypan above that depth. Runoff is rapid, and the hazard of water erosion is moderate. Water is perched above the very slowly permeable subsoil during rainy periods in spring.

The Soonahbe soil is deep and well drained. It formed in loess and loamy alluvium derived from mixed sources. Typically, the surface layer is pale brown silt loam 6 inches thick. The upper 8 inches of the subsoil is yellowish brown loam, the next 10 inches is light yellowish brown clay loam, and the lower part to a depth of 31 inches is light yellowish brown loam. The upper 15 inches of the substratum is very pale brown silt loam, the next 13 inches is a very pale brown, indurated hardpan, and the lower part to a depth of 80 inches is very pale brown silt loam. Below this to a depth of 84 inches or more is gravelly coarse sand.

Permeability of the Soonahbe soil is moderately slow. Available water capacity is very high. Effective rooting depth is 42 to 52 inches. Runoff is slow, and the hazard of water erosion is moderate.

Most areas of this unit are used for livestock grazing. A few areas are used as irrigated cropland.

The potential plant community on the Thacker soil is mainly low sagebrush and Idaho fescue. The potential plant community on the Soonahbe soil is mainly basin big sagebrush, Idaho fescue, and bluebunch wheatgrass. If the range deteriorates, Idaho fescue and bluebunch wheatgrass decrease and are gradually replaced by less desirable annual and perennial grasses such as cheatgrass and bottlebrush squirreltail. Sagebrush generally increases.

This unit is suited to livestock grazing in spring and fall. The main limitation is wetness in spring. The Thacker soil is shallow to a claypan. In spring the claypan swells upon wetting and restricts the downward movement of water. The surface then becomes saturated, and the soil is particularly susceptible to trampling and soil compaction. Compaction generally reduces the water intake rate, increases erosion, and ultimately reduces the productivity of the soil. Grazing should be delayed until the soil has drained sufficiently and is firm enough to withstand trampling by livestock. Availability of water for livestock may be a concern in fall. This unit is suited to brush control by chemicals.

This unit is poorly suited to irrigated cultivated crops. It is limited mainly by the hazard of erosion and the shallow depth to the claypan in the Thacker soil. To help control erosion, all tillage should be on the contour or across the slope. The flow of runoff in drainageways can be reduced by the use of grassed waterways. The claypan in the Thacker soil restricts the growth of roots and the movement of water through the profile. Subsoiling opens up this claypan and allows water and roots to pass through. Moldboard plowing may bring the claypan to the surface; therefore, field preparations such as subsoiling and disking are better suited to this soil.

Sprinkler irrigation is a suitable method of applying water. Because of the very slow permeability of the Thacker soil, applications of irrigation water should be light and frequent.

This map unit is in capability subclass IVe, irrigated and nonirrigated.

43—Thacker-Yatahoney complex, 1 to 8 percent slopes. This map unit is on alluvial terraces and dissected fan terraces. Elevation is 5,290 to 5,410 feet. The average annual precipitation is about 15 inches, the average annual air temperature is about 44 degrees F, and the average frost-free period is 80 to 100 days.

This unit is about 45 percent Thacker loam, mainly in eroded areas on terraces and side slopes and 25 percent Yatahoney loam on mounds and side slopes. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Included in this unit are small areas of Thacker extremely stony loam and Rock outcrop near basalt escarpments and on eroded side slopes, Disabel Variant silt loam and Bluecreek Variant silt loam in drainageways, and Bluecreek sandy loam scattered throughout the unit. Also included are small areas of soils that have more than 35 percent rock fragments in the subsoil and soils that are similar to the Thacker soil

but have a hardpan at a depth of less than 20 inches and are scattered throughout the unit.

The Thacker soil is moderately deep and well drained. It formed in alluvium derived dominantly from basalt and rhyolite. Typically, the upper 4 inches of the surface layer is pale brown loam and the lower 8 inches is pale brown gravelly loam. The subsoil is dark yellowish brown clay 9 inches thick. A light yellowish brown, indurated hardpan is at a depth of 21 inches. The upper 13 inches of the substratum is light yellowish brown, slightly cemented extremely gravelly sand, and the lower part to a depth of 84 inches or more is strata of gravelly sand and sand.

Permeability of the Thacker soil is very slow. Available water capacity is low to moderate. Effective rooting depth is 20 to 40 inches, but penetration and distribution of roots are limited by the claypan above that depth. Runoff is rapid, and the hazard of water erosion is moderate. Water is perched above the very slowly permeable subsoil during rainy periods in spring.

The Yatahoney soil is moderately deep and well drained. It formed in alluvium derived dominantly from basalt and rhyolite. Typically, the surface layer is very pale brown loam 4 inches thick. The upper 5 inches of the subsoil is light yellowish brown clay loam, and the lower 16 inches is light yellowish brown and brownish yellow clay. The next layer is a very pale brown, cemented hardpan.

Permeability of the Yatahoney soil is slow. Available water capacity is low to moderate. Effective rooting depth is 20 to 38 inches, but penetration and distribution of roots are limited by the claypan above that depth. Runoff is medium, and the hazard of water erosion is moderate. Water is perched above the slowly permeable subsoil during rainy periods in spring.

This unit is used for livestock grazing.

The potential plant community on the Thacker soil is mainly low sagebrush, Idaho fescue, and bluebunch wheatgrass. The potential plant community on the Yatahoney soil is mainly alkali sagebrush and Idaho fescue. If the range deteriorates, Idaho fescue and bluebunch wheatgrass decrease and are gradually replaced by less desirable forage plants. Bottlebrush squirreltail, phlox, and sagebrush generally increase.

This unit is suited to livestock grazing in spring and fall. The main limitation is wetness in spring. The soils in this unit are shallow to a claypan. In spring the claypan swells upon wetting and restricts the downward movement of water. The surface then becomes saturated, making the soils particularly susceptible to trampling and soil compaction. Compaction generally reduces the water intake rate, increases erosion, and ultimately reduces the productivity of the soils. Grazing should be delayed until the soils have drained sufficiently and are firm enough to withstand trampling by livestock. Availability of water for livestock may be a concern in fall. This unit is suited to brush control by chemicals.

This unit is poorly suited to irrigated cultivated crops. It is limited mainly by the shallow depth to a claypan and the hazard of erosion. The claypan in the soils restricts the growth of roots and the movement of water through the profile. Subsoiling opens up this claypan and allows water and roots to pass through. Moldboard plowing may bring the claypan to the surface; therefore, field preparations such as subsoiling and disking are better suited to this unit. To help control erosion, all tillage should be on the contour or across the slope.

Sprinkler irrigation is a suitable method of applying water. Because of the restricted permeability of the soils in this unit, applications of irrigation water should be light and frequent.

This map unit is in capability subclass IVe, irrigated and nonirrigated.

44—Tucker silty clay loam, 0 to 2 percent slopes. This very deep, somewhat poorly drained soil is on flood plains of the Owyhee River. It formed in alluvium derived from mixed sources. Elevation is 5,270 to 5,290 feet. The average annual precipitation is about 15 inches, the average annual air temperature is about 44 degrees F, and the average frost-free period is 80 to 100 days.

Included in this unit are small areas of Hayspur clay loam in channels and depressional areas and Zola loam in the slightly higher areas. Also included are small areas of Tucker silty clay loam, gravelly substratum, and soils that are similar to this Tucker soil but are high in content of sodium and are scattered throughout the unit. Included areas make up about 25 percent of the total acreage.

Typically, the upper 4 inches of the surface layer is dark gray silty clay loam, the next 13 inches is dark gray silty clay, and the lower part to a depth of 24 inches is grayish brown silty clay loam. The upper 20 inches of the underlying material is gray silty clay loam, the next 15 inches is light brownish gray silty clay loam, and the lower part to a depth of 84 inches or more is gray clay loam.

Permeability of this Tucker soil is slow. Available water capacity is very high. Effective rooting depth is limited by a seasonal high water table that is at a depth of 1.5 to 3.0 feet from March through June. This soil is subject to frequent, long periods of flooding in March through May. Runoff is slow, and the hazard of water erosion is slight.

This unit is used for the production of hay and pasture.

This unit is suited to irrigated hay and pasture. It is limited mainly by wetness in spring and early in summer. Wetness limits the choice of plants and the period of cutting and grazing. Grazing should be delayed until the soil has drained sufficiently and is firm enough to withstand trampling by livestock. The seasonal high water table generally limits the suitability of the soil in this unit for deep-rooted crops. Subsurface drainage can be used to lower the water table if a suitable outlet is available.

After the water table is lowered, irrigation is needed for maximum production of hay and pasture. Border, corrugation, and sprinkler irrigation systems are suited to this unit. Irrigation water needs to be applied carefully to prevent the buildup of a high water table. Drainage may also be needed. Because of the slow permeability of the soil, applications of irrigation water should be adjusted to permit adequate infiltration. For the efficient application and distribution of surface irrigation water, leveling may be needed.

This unit has potential for the production of irrigated barley and nonirrigated winter wheat.

This map unit is in capability subclass Vw, irrigated and nonirrigated.

45—Tucker silty clay loam, gravelly substratum, 0 to 2 percent slopes. This very deep, somewhat poorly drained soil is on flood plains of Blue Creek. It formed in alluvium derived from mixed sources. Elevation is 5,295 to 5,310 feet. The average annual precipitation is about 15 inches, the average annual air temperature is about 44 degrees F, and the average frost-free period is 80 to 100 days.

Included in this unit are small areas of Blackfoot silt loam in slightly higher, convex areas; Boulder Lake clay near active stream channels; and deposits of sand and gravel in old stream channels. Also included are small areas of Disabel Variant silt loam, Bluecreek Variant silt loam, and Tucker Variant silty clay loam scattered throughout the unit. Included areas make up about 25 percent of the total acreage.

Typically, the upper 2 inches of the surface layer is light brownish gray silt loam and the lower 11 inches is gray silty clay. The upper 9 inches of the subsoil is gray silty clay, the next 16 inches is white clay loam, and the lower part to a depth of 46 inches is light gray loam. The substratum to a depth of 84 inches or more is strata of gravelly coarse sand.

Permeability of this Tucker soil is slow to a depth of 46 inches and very rapid below this depth. Available water capacity is very high. Effective rooting depth is limited by a seasonal high water table that is at a depth of 1.5 to 3.0 feet from March through June. This soil is subject to frequent, long periods of flooding in March through May. Runoff is slow, and the hazard of water erosion is slight.

This unit is used for livestock grazing.

The potential plant community on this unit is mainly tufted hairgrass, slender wheatgrass, sedges, rushes, and other meadow plants. If the range deteriorates, tufted hairgrass, slender wheatgrass, and sedges decrease and are gradually replaced by less desirable forage plants.

This unit is suited to livestock grazing in summer and fall. The main limitation is wetness early in summer because of seasonal flooding. Grazing should be delayed until the soil has drained sufficiently and is firm enough to withstand trampling by livestock. Limitations for mechanical seeding and brush control are moderate to severe during rainy periods and when the water table is high. If chemical brush control is used in areas subject to flooding, care should be taken to avoid contaminating streams. Rate and time of application are important considerations.

This unit provides valuable habitat for wetland wildlife.

This unit is suited to irrigated hay and pasture. The main limitation is wetness in spring and early in summer.

This map unit is in capability subclass Vw, irrigated and nonirrigated.

46—Tucker Variant silty clay loam, 0 to 2 percent slopes. This very deep, somewhat poorly drained soil is on flood plains of Blue Creek. It formed in alluvium derived from mixed sources. Elevation is 5,300 to 5,310 feet. The average annual precipitation is about 15 inches, the average annual air temperature is about 44 degrees F, and the average frost-free period is 80 to 100 days.

Included in this unit are small areas of Bluecreek Variant silt loam in slightly concave areas, Boulder Lake clay near stream channels, and Tucker silty clay loam, gravelly substratum, scattered throughout the unit. Included areas make up about 20 percent of the total acreage.

Typically, the upper 2 inches of the surface layer is gray silt loam and the lower 5 inches is gray silty clay loam. The upper 11 inches of the subsoil is dark gray clay, the next 5 inches is light brownish gray clay, and the lower part to a depth of 27 inches is light brownish gray clay loam. The substratum to a depth of 60 inches or more is variegated very gravelly sand.

Permeability of this Tucker Variant soil is slow to a depth of 27 inches and very rapid below this depth. Available water capacity is high. Effective rooting depth is limited by a seasonal high water table that is at a depth of 1.5 to 3.0 feet from March through June. This soil is subject to frequent, long periods of flooding in February through May. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing is high.

This unit is used for livestock grazing.

The potential plant community on this unit is mainly silver sagebrush and slender wheatgrass. If the range deteriorates, slender wheatgrass and other desirable grasses and forbs decrease and are gradually replaced by northern barley, bottlebrush squirreltail, and bluegrasses. Silver sagebrush and rabbitbrush generally increase.

This unit is suited to livestock grazing in spring and summer. The main limitation is wetness in spring. Grazing should be delayed until the soil has drained sufficiently and is firm enough to withstand trampling by livestock. Limitations for mechanical seeding and brush control are moderate during rainy periods and spring ponding. If chemical brush control is used in areas subject to flooding, care should be taken to avoid

contaminating streams. Rate and time of application are important considerations.

Some species of shore birds may use this unit as nesting areas.

This unit is suited to irrigated hay and pasture. The main limitation is wetness in spring and early in summer.

This map unit is in capability subclass Vw, irrigated and nonirrigated.

47—Watchabob-Bearskin Variant complex, 10 to 40 percent slopes. This map unit is on hills. Elevation is 5,600 to 6,800 feet. The average annual precipitation is 13 to 16 inches, the average annual air temperature is 43 to 45 degrees F, and the average frost-free period is 70 to 90 days.

This unit is about 50 percent Watchabob gravelly coarse sandy loam in areas throughout the unit and 30 percent Bearskin Variant loam on hill summits and shoulder slopes. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Included in this unit are small areas of a soil that is similar to the Watchabob soil but is deep, has more than 35 percent clay in the subsoil, and is in and near drainageways and small areas of Rock outcrop near drainageways and on ridgetops.

The Watchabob soil is moderately deep and well drained. It formed in colluvium derived dominantly from granite. Typically, the surface layer is dark grayish brown and brown gravelly coarse sandy loam 15 inches thick. The upper 6 inches of the subsoil is grayish brown gravelly coarse sandy loam, and the lower 5 inches is brown gravelly sandy clay loam. The substratum is extremely gravelly coarse sandy loam 2 inches thick over granite.

Permeability of the Watchabob soil is moderately slow. Available water capacity is low. Effective rooting depth is 20 to 40 inches. Runoff is very rapid, and the hazard of water erosion is very high. The hazard of soil blowing is high.

The Bearskin Variant soil is shallow and well drained. It formed in colluvium derived dominantly from granite. Typically, the surface layer is grayish brown loam 8 inches thick. The upper 4 inches of the subsoil is brown gravelly clay loam, and the lower 4 inches is brown very gravelly sandy clay loam. Granite is at a depth of 16 inches.

Permeability of the Bearskin Variant soil is moderately slow. Available water capacity is very low. Effective rooting depth is 10 to 20 inches. Runoff is very rapid, and the hazard of water erosion is very high.

This unit is used for livestock grazing.

The potential plant community on the Watchabob soil is mainly mountain big sagebrush and Idaho fescue. The potential plant community on the Bearskin Variant soil is mainly stunted mountain big sagebrush and Idaho fescue. If the potential plant community deteriorates, less preferred forage plants increase. Among the plants that increase are mountain big sagebrush, rabbitbrush, and lupine.

This unit is suited to livestock grazing in summer. The main limitation is the hazard of erosion. Livestock grazing should be managed to protect the soils from excessive erosion. Loss of the surface layer results in a severe decrease in productivity and in the potential of the soils to produce forage.

This map unit is in capability subclass VIe.

48—Wickahoney stony loam, 2 to 20 percent slopes. This shallow, well drained soil is on hills. It formed in residuum derived dominantly from rhyolite and rhyolitic tuff. Elevation is 5,300 to 7,200 feet. The average annual precipitation is 13 to 16 inches, the average annual air temperature is 42 to 45 degrees F, and the average frost-free period is 60 to 90 days.

Included in this unit are small areas of soils that are similar to the Cavanaugh soil but have bedrock within 20 inches of the surface and small areas of Rock outcrop and Rubble land. Included areas make up about 35 percent of the total acreage.

Typically, as much as 3 percent of the surface is covered with stones. The upper 5 inches of the surface layer is pale brown stony loam, and the lower 5 inches is pale brown very cobbly loam. The upper 3 inches of the subsoil is pale brown very cobbly loam, and the lower 5 inches is yellowish brown very cobbly clay. Rhyolite is at a depth of 18 inches.

Permeability of this Wickahoney soil is slow. Available water capacity is very low. Effective rooting depth is 10 to 20 inches. Runoff is very rapid, and the hazard of water erosion is moderate.

This unit is used for livestock grazing.

The potential plant community on this unit is mainly low sagebrush and Idaho fescue. If the potential plant community deteriorates, less preferred forage plants increase. Among the plants that increase because of overgrazing are low sagebrush, bottlebrush squirreltail, and phlox.

This unit is suited to livestock grazing in summer. The main limitation is stoniness. Plant growth is limited mainly by the very low available water capacity of the soil. Large stones on the surface limit mechanical seeding. Droughtiness and shallow rooting depth restrict seedling establishment.

This map unit is in capability subclass VIe.

49—Wickahoney-Blackleg association, 2 to 30 percent slopes. This map unit is on faulted tablelands. Elevation is 6,000 to 6,300 feet. The average annual precipitation is about 16 inches, the average annual air temperature is about 42 degrees F, and the average frost-free period is 70 to 90 days.

This unit is about 40 percent Wickahoney rubbly silt loam, 2 to 30 percent slopes, on tableland summits and

30 percent Blackleg stony loam, 3 to 30 percent slopes, on tableland side slopes.

Included in this unit are small areas of Rock outcrop and Rubble land scattered throughout the unit.

The Wickahoney soil is shallow and well drained. It formed in material derived dominantly from weathered basalt. Typically, 50 to 90 percent of the surface is covered with stones. The upper 4 inches of the surface layer is light brownish gray rubbly silt loam, and the lower 2 inches is grayish brown cobbly clay loam. The subsoil is brown very cobbly clay 10 inches thick. Basalt is at a depth of 16 inches.

Permeability of the Wickahoney soil is slow. Available water capacity is very low. Effective rooting depth is 10 to 20 inches. Runoff is rapid, and the hazard of water erosion is moderate. Water is perched above the slowly permeable subsoil in spring.

The Blackleg soil is moderately deep and well drained. It formed in colluvium and alluvium derived dominantly from basalt. Typically, as much as 3 percent of the surface is covered with stones. The upper 6 inches of the surface layer is brown stony loam, and the lower 7 inches is brown loam. The upper 10 inches of the subsoil is brown cobbly clay loam, and the lower 6 inches is yellowish brown very cobbly clay. Below this is a light yellowish brown, cemented hardpan 31 inches thick or more.

Permeability of the Blackleg soil is slow. Available water capacity is moderate. Effective rooting depth is 20 to 40 inches. Runoff is very rapid, and the hazard of water erosion is very high.

This unit is used for livestock grazing.

The potential plant community on the Wickahoney soil is mainly alkali sagebrush, low sagebrush, and Idaho fescue. The potential plant community on the Blackleg soil is mainly mountain big sagebrush and Idaho fescue. If the range deteriorates, Idaho fescue and other palatable grasses decrease and are gradually replaced by less desirable forage plants such as bottlebrush squirreltail, phlox, and lupine. Sagebrush generally increases.

This unit is suited to livestock grazing in summer. The main limitation for livestock grazing, mechanical seeding, and brush control is stoniness.

The Wickahoney soil is in capability subclass VIIs, nonirrigated, and the Blackleg soil is in capability subclass IVe, nonirrigated.

50—Wickahoney-Wagonbox complex, 2 to 8 percent slopes. This map unit is on tablelands. Elevation is 5,400 to 6,600 feet. The average annual precipitation is about 15 inches, the average annual air temperature is about 44 degrees F, and the average frost-free period is 70 to 90 days.

This unit is about 50 percent Wickahoney rubbly silt loam and 20 percent Wagonbox rubbly silty clay loam. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Included in this unit are small areas of Deunah stony silt loam on summits and small areas of Rubble land and Rock outcrop scattered throughout the unit. Also included are small areas of basalt escarpments along fault zones and ridges.

The Wickahoney soil is shallow and well drained. It formed in residuum derived dominantly from basalt. Typically, 50 to 90 percent of the surface is covered with stones. The upper 4 inches of the surface layer is light brownish gray rubbly silt loam, and the lower 2 inches is grayish brown cobbly clay loam. The subsoil is brown very cobbly clay 10 inches thick. Basalt is at a depth of 16 inches.

Permeability of the Wickahoney soil is slow. Available water capacity is very low. Effective rooting depth is 10 to 20 inches. Runoff is rapid, and the hazard of water erosion is moderate. Water is perched above the slowly permeable subsoil in spring.

The Wagonbox soil is shallow and well drained. It formed in residuum derived dominantly from basalt. Typically, 50 to 90 percent of the surface is covered with stones. The surface layer is brown rubbly silty clay loam 5 inches thick. The subsoil is yellowish brown very stony clay 12 inches thick. Below this is a very pale brown, cemented hardpan about 6 inches thick over basalt.

Permeability of the Wagonbox soil is slow. Available water capacity is very low. Effective rooting depth is 11 to 20 inches. Runoff is rapid, and the hazard of water erosion is moderate. Water is perched above the slowly permeable subsoil in spring.

This unit is used for livestock grazing.

The potential plant community on the Wickahoney and Wagonbox soils is mainly alkali sagebrush, low sagebrush, and Idaho fescue. If the potential plant community deteriorates, less preferred forage plants increase. Among the plants that increase are sagebrush, bottlebrush squirreltail, and phlox.

This unit is suited to livestock grazing in spring and summer. The main limitation is stoniness. Plant growth is limited mainly by the very low available water capacity of the soils. Large stones on the surface limit movement of livestock and limit mechanical seeding.

This map unit is in capability subclass VIIs.

51—Yatahoney-Blackleg complex, 4 to 20 percent slopes. This map unit is on scarps, foot slopes, and toe slopes of tablelands. Elevation is 5,400 to 6,000 feet. The average annual precipitation is about 15 inches, the average annual air temperature is about 44 degrees F, and the average frost-free period is 70 to 90 days.

This unit is about 55 percent Yatahoney very cobbly loam, 2 to 10 percent slopes, on toe slopes and 35 percent Blackleg extremely stony silt loam, 8 to 20 percent slopes, on foot slopes and scarps. The components of this unit are so intricately intermingled

that it was not practical to map them separately at the scale used.

Included in this unit are small areas of Burmah Variant silt loam on toe slopes, Paynecreek gravelly loam on steep scarps, and Rock outcrop and Rubble land near the rims of summits.

The Yatahoney soil is moderately deep and well drained. It formed in alluvium derived dominantly from basalt. Typically, 35 to 50 percent of the surface is covered with cobbles. The surface layer is pale brown very cobbly loam 4 inches thick. The subsoil is brown and yellowish brown clay 16 inches thick. A very pale brown, cemented hardpan is at a depth of 20 inches. Basalt is at a depth of 40 inches.

Permeability of the Yatahoney soil is slow. Available water capacity is low. Effective rooting depth is 20 to 38 inches, but penetration and distribution of roots are limited by the claypan above that depth. Runoff is rapid, and the hazard of water erosion is high.

The Blackleg soil is moderately deep and well drained. It formed in alluvium and colluvium derived dominantly from basalt. Typically, 15 to 50 percent of the surface is covered with stones. The surface layer is grayish brown extremely stony silt loam and silty clay loam 8 inches thick. The upper 7 inches of the subsoil is yellowish brown silty clay loam, the next 9 inches is light yellowish brown extremely cobbly clay, and the lower part to a depth of 34 inches is yellowish brown cobbly clay. The upper 3 inches of the substratum is very pale brown, violently effervescent cobbly clay, and the lower part to a depth of 60 inches or more is a very pale brown, cemented hardpan.

Permeability of the Blackleg soil is slow. Available water capacity is moderate. Effective rooting depth is 30 to 40 inches. Runoff is rapid, and the hazard of water erosion is moderate.

This unit is used for livestock grazing.

The potential plant community on the Yatahoney soil is mainly alkali sagebrush and Idaho fescue. The potential plant community on the Blackleg soil is mainly basin big sagebrush and Idaho fescue. If the potential plant community deteriorates, less preferred forage plants increase. Among the plants that increase are sagebrush, rabbitbrush, lupine, and phlox.

This unit is suited to livestock grazing in spring. The main limitations are wetness in spring in areas on the lower toe slopes and stoniness. In spring the claypan in the Yatahoney soil swells upon wetting and restricts the downward movement of water. The surface then becomes saturated, and the soil is particularly susceptible to trampling and soil compaction. Compaction generally reduces the water intake rate, increases erosion, and ultimately reduces the productivity of the soil. Grazing should be delayed until the soil has drained sufficiently and is firm enough to withstand trampling by livestock. Large stones on the surface of this unit limit movement of livestock and limit mechanical seeding. Placing salt on side slopes and in less intensively grazed areas encourages more uniform grazing.

This map unit is in capability subclass VIIs.

52—Yatahoney-Soonahbe complex, 2 to 10 percent slopes. This map unit is on basin floors and adjacent toe slopes of tablelands. Elevation is 5,300 to 5,600 feet. The average annual precipitation is about 14 inches, the average annual air temperature is about 44 degrees F, and the average frost-free period is 70 to 90 days.

This unit is about 65 percent Yatahoney loam, 2 to 10 percent slopes, in low-lying areas of basin floors, in concave areas, and on toe slopes and 20 percent Soonahbe silt loam, 2 to 8 percent slopes, in mounded areas. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Included in this unit are small areas of soils, near streams, that are similar to the Soonahbe soil but have unconsolidated ash within 60 inches of the surface and small areas of soils that have an extremely stony surface layer and are on or near toe slopes. Also included are small areas of soils that are similar to the Yatahoney soil but have a pan or bedrock within 20 inches of the surface and small areas of Rock outcrop.

The Yatahoney soil is moderately deep and well drained. It formed in alluvium derived dominantly from rhyolite and basalt. Typically, the surface layer is very pale brown loam 4 inches thick. The upper 5 inches of the subsoil is light yellowish brown clay loam, and the lower 16 inches is light yellowish brown and brownish yellow clay. Below this is a very pale brown, cemented hardpan about 7 inches thick over rhyolitic tuff.

Permeability of the Yatahoney soil is slow. Available water capacity is moderate. Effective rooting depth is 20 to 38 inches, but penetration and distribution of roots are limited by the claypan above that depth. Runoff is rapid, and the hazard of water erosion is high. Water is perched above the slowly permeable subsoil in spring.

The Soonahbe soil is deep and well drained. It formed in loess and alluvium derived dominantly from rhyolite and basalt. Typically, the surface layer is pale brown silt loam 5 inches thick. The upper 16 inches of the subsoil is yellowish brown loam, and the lower 25 inches is very pale brown clay loam. A very pale brown, cemented hardpan is at a depth of 46 inches.

Permeability of the Soonahbe soil is moderately slow. Available water capacity is very high. Effective rooting depth is 42 to 52 inches. Runoff is rapid, and the hazard of water erosion is moderate.

This unit is used for livestock grazing.

The potential plant community on the Yatahoney soil is mainly alkali sagebrush and Idaho fescue. The potential plant community on the Soonahbe soil is mainly basin big sagebrush and Idaho fescue. If the potential plant community deteriorates, less preferred forage

plants increase. Among the plants that increase are sagebrush, rabbitbrush, and bottlebrush squirreltail.

This unit is suited to livestock grazing in spring and summer. The main limitations are the hazard of erosion and wetness in spring. The Yatahoney soil is shallow to a claypan. In spring the claypan swells upon wetting and restricts the downward movement of water. The surface then becomes saturated, and the soil is particularly susceptible to trampling and soil compaction. Compaction generally reduces the water intake rate, increases erosion, and ultimately reduces the productivity of the soil. Livestock grazing should be managed to protect the unit from excessive erosion, trampling, and soil compaction. Loss of the surface layer results in a severe decrease in productivity and in the potential of the Yatahoney and Soonahbe soils to produce forage. The natural drainageways characteristic of this unit provide excellent opportunities for developing livestock water reservoirs.

This map unit is in capability subclass IVe.

53—Zola loam, 0 to 2 percent slopes. This very deep, moderately well drained soil is on flood plains. It formed in recent stratified alluvium derived from mixed sources. Elevation is 5,300 to 5,410 feet. The average annual precipitation is about 15 inches, the average annual air temperature is about 44 degrees F, and the average frost-free period is 80 to 100 days.

Included in this unit are small areas of Blackfoot silt loam in depressional areas and swales, a soil that is similar to this Zola soil but has sand and gravel within 40 inches of the surface and is near old stream channels, and a soil that is moderately well drained and is near high terraces. Also included are small areas of sand and gravel bars scattered throughout the unit. Included areas make up about 10 percent of the total acreage.

Typically, the surface layer is grayish brown loam 16 inches thick. Below this is a buried surface layer of grayish brown silty clay loam 12 inches thick. The subsoil is light brownish gray, calcareous loam 17 inches thick. The upper 20 inches of the substratum is light brownish gray loam, the next 8 inches is variegated loamy coarse sand, and the lower part to a depth of 84 inches or more is light brownish gray clay loam.

Permeability of this Zola soil is moderately slow. Available water capacity is very high. Effective rooting depth is limited by a seasonal high water table that is at a depth of 3 to 5 feet from March through June. Runoff is slow, and the hazard of water erosion is slight.

Most areas of this unit are used for irrigated alfalfa, grass hay, and pasture. A few areas are used as rangeland and homesites.

This unit is well suited to hay and pasture. It has few limitations. Border, corrugation, and sprinkler irrigation systems are suited to this unit. Irrigation water needs to be applied carefully to prevent the buildup of a high water table. For the efficient application and distribution of surface irrigation water, leveling may be needed. Drainage may also be needed.

This unit is suited to irrigated barley and wheat. It has few limitations. The unit has potential for the production of nonirrigated winter wheat.

The potential plant community on this unit is mainly basin big sagebrush, Idaho fescue, and bluebunch wheatgrass. If the range deteriorates, Idaho fescue and bluebunch wheatgrass decrease and are gradually replaced by cheatgrass and other annuals. Basin big sagebrush and rabbitbrush generally increase.

This unit is suited to livestock grazing in spring and fall. It has few limitations for livestock grazing, mechanical seeding, or brush control.

If this unit is used for homesite development, the main limitations are wetness and the moderately slow permeability. Wetness can be reduced by installing drain tile around foundations. The moderately slow permeability and the high water table increase the possibility of failure of septic tank absorption fields. The limitation of moderately slow permeability can be overcome by increasing the size of the absorption field.

This map unit is in capability subclass IIIw, irrigated and nonirrigated.

54—Zola loam, frequently flooded, 0 to 2 percent slopes. This very deep, moderately well drained soil is on flood plains. It formed in recent stratified alluvium derived from mixed sources. Elevation is 5,270 to 5,300 feet. The average annual precipitation is about 15 inches, the average annual air temperature is about 44 degrees F, and the average frost-free period is 80 to 100 days.

Included in this unit are small areas of Tucker silty clay loam in depressional areas and Paynecreek gravelly loam near the higher terraces. Included areas make up about 10 percent of the total acreage.

Typically, the surface layer is grayish brown loam 16 inches thick. Below this is a buried surface layer of grayish brown silty clay loam 12 inches thick. The subsoil is light brownish gray, calcareous loam 17 inches thick. The upper 20 inches of the substratum is light brownish gray loam, the next 8 inches is variegated loamy coarse sand, and the lower part to a depth of 84 inches or more is light brownish gray clay loam.

Permeability of this Zola soil is moderately slow. Available water capacity is very high. Effective rooting depth is limited by a seasonal high water table that is at a depth of 3 to 5 feet from March through June. This soil is subject to frequent, long periods of flooding in March through June. Runoff is slow, and the hazard of water erosion is slight.

This unit is used for livestock grazing.

The potential plant community on this unit is mainly basin big sagebrush, Idaho fescue, and bluebunch wheatgrass. If the range deteriorates, Idaho fescue and bluebunch wheatgrass decrease and are gradually

replaced by cheatgrass and other annuals. Basin big sagebrush and rabbitbrush generally increase.

This unit is suited to livestock grazing in spring and fall. The main limitation is flooding in spring and early in summer. Grazing should be delayed until the soil has drained sufficiently and is firm enough to withstand trampling by livestock. If chemical brush control is used in areas subject to flooding, care should be taken to avoid contaminating streams. Rate and time of application are important considerations.

This unit is suited to irrigated hay and pasture. The main limitation is flooding. Border, corrugation, and sprinkler irrigation systems are suited to this unit. For the efficient application and distribution of surface irrigation water, leveling may be needed.

This map unit is in capability subclass Vw, irrigated and nonirrigated.

55—Zola-Hayspur complex, channeled. This map unit is on flood plains of the Owyhee River. Slope is 0 to 2 percent. Elevation is 5,260 to 5,400 feet. The average annual precipitation is about 15 inches, the average annual air temperature is about 44 degrees F, and the average frost-free period is 80 to 100 days.

This unit is about 50 percent Zola loam in the higher areas and 35 percent Hayspur clay loam in swales and sloughs. The banks of the channels are short and steep. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Included in this unit are small areas of Blackfoot silt loam, frequently flooded, on the higher parts of the swales and small areas of marsh in some of the channels.

The Zola soil is very deep and moderately well drained. It formed in recent stratified alluvium derived from mixed sources. Typically, the surface layer is grayish brown loam 16 inches thick. Below this is a buried surface layer of grayish brown silty clay loam 12 inches thick. The subsoil is light brownish gray, calcareous loam 17 inches thick. The upper 20 inches of the substratum is light brownish gray loam, the next 8 inches is variegated loamy coarse sand, and the lower part to a depth of 84 inches or more is light brownish gray clay loam.

Permeability of this Zola soil is moderately slow. Available water capacity is very high. Effective rooting depth is limited by a seasonal high water table that is at a depth of 3 to 5 feet from March through June. Runoff is slow, and the hazard of water erosion is slight.

The Hayspur soil is very deep and poorly drained. It formed in recent stratified alluvium derived from mixed sources. Typically, the upper 13 inches of the surface layer is grayish brown clay loam and the lower 8 inches is light brownish gray clay loam. Below this to a depth of 30 inches is a buried surface layer of gray loam. The subsoil is light gray silt loam 10 inches thick. The upper 19 inches of the substratum is light gray silt loam, and the lower part to a depth of 84 inches or more is variegated very gravelly loamy sand.

Permeability of this Hayspur soil is moderately slow to a depth of 59 inches and rapid below this depth. Available water capacity is very high. Effective rooting depth is limited by a seasonal high water table that fluctuates between the surface and a depth of 1 foot from March through June. This soil is subject to frequent, long periods of flooding in March through June. Runoff is slow, and the hazard of water erosion is slight.

Most areas of this unit are used for livestock grazing. A few areas are used for irrigated hay and pasture.

The potential plant community on the Zola soil is mainly basin big sagebrush, Idaho fescue, and bluebunch wheatgrass. If the range deteriorates, Idaho fescue and bluebunch wheatgrass decrease and are gradually replaced by less desirable forage plants. Basin big sagebrush and rabbitbrush generally increase. The potential plant community on the Hayspur soil is mainly tufted hairgrass, slender wheatgrass, sedges, rushes, and other meadow plants. If the range deteriorates, tufted hairgrass, slender wheatgrass, and sedges decrease and are gradually replaced by less desirable forage plants. Rushes generally increase.

This unit is suited to livestock grazing in spring and fall. Grazing may be limited in areas that are deeply channeled. The Zola soil has few limitations for livestock grazing. The main limitation of the Hayspur soil is wetness in spring and early in summer. Grazing should be delayed until the soil has drained sufficiently and is firm enough to withstand trampling by livestock. Limitations for mechanical seeding and brush control are moderate during rainy periods, when the water table is high, and in areas that are deeply channeled. If chemical brush control is used in areas subject to flooding, care should be taken to avoid contaminating streams. Rate and time of application are important considerations.

Areas of this unit that have been leveled are suited to irrigated hay and pasture; however, leveling may disrupt the natural drainage pattern and allow spring runoff to collect in low-lying areas. Runoff may also back up in the channels upstream from the leveled areas. Artificial drainage may be needed.

This map unit is in capability subclass Vw, irrigated and nonirrigated.

Prime Farmland

Prime farmland, as defined by the U.S. Department of Agriculture, is the land that is best suited to producing food, seed, forage, fiber, and oilseed crops. It must either be used for producing food or fiber or be available for these uses. It has the soil quality, length of growing season, and moisture supply needed to economically produce a sustained high yield of crops when it is managed properly. Prime farmland soils produce the highest yields with minimal energy and economic resources, and farming these soils results in the least disturbance to the environment.

Prime farmland commonly has an adequate and dependable supply of moisture from precipitation or irrigation. It also has a favorable temperature and length of growing season and an acceptable level of acidity and alkalinity. The soils have few, if any, rock fragments and are permeable to water and air. They are not excessively erodible or saturated with water for long periods and are not flooded during the growing season. The slope ranges mainly from 0 to 6 percent.

About 10,300 acres, or nearly 4 percent of the survey area, meets the requirements for prime farmland. Prime farmland is in the central part of the area, mainly in general soil map units 1 and 4. Most of the prime farmland is used for pasture and the production of alfalfa and alfalfa-grass hay. A few areas are used as rangeland.

The detailed soil map units that make up the prime farmland in this survey area are listed in this section. This list does not constitute a recommendation for a particular land use. Soils that have limitations such as a high water table, flooding, or inadequate rainfall may qualify as prime farmland if these limitations are overcome by such measures as drainage, flood control, or irrigation. The map units in the following list qualify as prime farmland if they are irrigated.

23 Paynecreek gravelly loam, 1 to 4 percent slopes
34 Soonahbe silt loam, 1 to 3 percent slopes
53 Zola loam, 0 to 2 percent slopes

Use and Management of the Soils

This soil survey is an inventory and evaluation of the soils in the survey area. It can be used to adjust land uses to the limitations and potentials of natural resources and the environment. Also, it can help avoid soil-related failures in land uses.

In preparing a soil survey, soil scientists, conservationists, engineers, and others collect extensive field data about the nature and behavioral characteristics of the soils. They collect data on erosion, droughtiness, flooding, and other factors that affect various soil uses and management. Field experience and collected data on soil properties and performance are used as a basis in predicting soil behavior.

Information in this section can be used to plan the use and management of soils for crops and pasture; as rangeland; as sites for buildings, sanitary facilities, highways and other transportation systems, and parks and other recreation facilities; and for wildlife habitat. It can be used to identify the potentials and limitations of each soil for specific land uses and to help prevent construction failures caused by unfavorable soil properties.

Planners and others using soil survey information can evaluate the effect of specific land uses on productivity and on the environment in all or part of the survey area. The survey can help planners to maintain or create a land use pattern in harmony with the natural soil.

Contractors can use this survey to locate sources of sand and gravel, roadfill, and topsoil. They can use it to identify areas where bedrock, wetness, or very firm soil layers can cause difficulty in excavation.

Health officials, highway officials, engineers, and others may also find this survey useful. The survey can help them plan the safe disposal of wastes and locate sites for pavements, sidewalks, campgrounds, playgrounds, lawns, and trees and shrubs.

Crops and Pasture

General management needed for crops and pasture is suggested in this section. The crops or pasture plants best suited to the soils, including some not commonly grown in the survey area, are identified; the system of land capability classification used by the Soil Conservation Service is explained; and the estimated yields of the main crops and hay and pasture plants are listed for each soil.

Planners of management systems for individual fields or farms should consider the detailed information given in the description of each soil under "Detailed Soil Map Units." Specific information can be obtained from the local office of the Soil Conservation Service, the Cooperative Extension Service, or the Bureau of Indian Affairs.

The economy of the survey area is based primarily on livestock production and related operations. Most of the agricultural land is used for improved pasture and hay production. Much of the hay is used by local ranches, but some is transported to outside markets. Beef cattle operations are by far the most important livestock enterprises.

The semiarid climate in the survey area limits the types of crops that can be grown and the yields. Alfalfa, grass hay, and small grain such as barley, wheat, and oats are best suited to the limited growing season. Irrigation is needed for maximum production of most crops.

About 5,000 acres is used for hay production. Of this, about 2,500 acres is used for native grass hay and 2,500 acres is used for alfalfa and grass hay. About 5,000 acres is used for pasture. A small acreage is used for barley.

Since 1979, the development of additional acreage of cropland has increased significantly. Rangeland has been cleared and sprinkler irrigation systems have been installed south and west of Thacker Slough and east of Mountain View Reservoir. More rangeland in these areas probably will be developed for use as cropland in the future. Deep, loamy, well drained soils such as those of the Simonton and Soonahbe series have excellent potential for conversion from rangeland to cropland.

Natural soil fertility is moderate to high in most of the soils in the survey area; however, additions of fertilizer are essential for the optimal production of all crops, including hay and pasture.

Organic matter in the soil is important for crop production. It increases the water intake rate, reduces surface crusting, reduces soil losses because of erosion, and promotes good tilth. The organic matter content can be maintained or increased by returning crop residue to the soil and by adding manure regularly.

Minimizing tillage and cultivation helps to maintain crop residue on the surface and helps to preserve soil structure. This increases the infiltration of water, helps to

maintain soil tilth, and reduces the risks of water erosion and soil blowing.

Excessive cultivation can result in the formation of a compacted soil layer below the depth of plowing. This tillage pan can be broken by chiseling when the soil is dry, thereby increasing the effective rooting depth and improving internal drainage. The reduced use of inversion-type tillage combined with occasional chiseling and subsoiling will prevent the formation of a tillage pan.

The majority of the hayland and pastureland is on the broad, nearly level flood plain of the Owyhee River. Soil drainage and irrigation water management are the primary management practices needed. In fields where the water table is high, such as areas of Blackfoot, Hayspur, and Tucker soils, subsurface drainage may be practical. Drainage is needed in these poorly drained and somewhat poorly drained soils for maximum production of deep-rooted legumes, such as alfalfa.

Surface irrigation is used on most of the land on the Owyhee River flood plain. Irrigation water management is essential on these surface-irrigated fields for efficient use of water and optimum crop yields. Application of irrigation water should be adjusted to the available water capacity, the water intake rate, and the crop needs to avoid overirrigating and leaching of plant nutrients. Leveling is needed in many areas for the efficient application and removal of irrigation water. A method of removing and disposing of irrigation return flows is necessary on all surface irrigation systems.

Proper stocking rate, pasture deferment and rotation, and restricted grazing during wet periods help to keep pasture in good condition.

The introduction of highly productive forage plants and an effective fertilization program improves yields of hay substantially on the poorly drained and somewhat poorly drained soils.

Sprinkler irrigation is well suited on the rolling topography in the areas of Simonton, Soonahbe, Paynecreek, and Thacker soils. Sprinkler irrigation improves the efficiency of the irrigation water, and its use eliminates the need for land smoothing. It permits the even, controlled application of water. Water should be applied at a rate that insures optimum production without increasing runoff, deep percolation, and erosion. Soil erosion is a hazard in the sloping areas now under sprinkler irrigation. Excessive irrigation increases the risk of erosion. Maintaining crop residue on or near the surface and farming across the slope reduces runoff and minimizes the risk of erosion. Minimum tillage helps to prevent the destruction of soil structure, thereby reducing the risk of erosion.

Soil blowing may be a hazard in areas of the Simonton and Soonahbe soils when the soil surface is cultivated for seedbed preparation. Keeping the surface rough and cloddy reduces the risk of soil blowing.

Yields per Acre

The average yields per acre that can be expected of the principal crops under a high level of management are shown in table 5. In any given year, yields may be higher or lower than those indicated in the table because of variations in rainfall and other climatic factors.

The yields are estimates made by agronomists and conservationists. They are based mainly on precipitation records, the frost-free season, and the kind of soil. Available yield data from similar areas are also considered.

The management needed to obtain the indicated yields of the various crops depends on the kind of soil and the crop. Management can include drainage, erosion control, and protection from flooding; the proper planting and seeding rates; suitable high-yielding crop varieties; appropriate and timely tillage; control of weeds, plant diseases, and harmful insects; favorable soil reaction and optimum levels of nitrogen, phosphorus, potassium, and trace elements for each crop; effective use of crop residue, barnyard manure, and green-manure crops; and harvesting that insures the smallest possible loss.

For yields of irrigated crops, it is assumed that the irrigation system is adapted to the soils and to the crops grown, that good quality irrigation water is uniformly applied as needed, and that tillage is kept to a minimum.

The estimated yields reflect the productive capacity of each soil for each of the principal crops. Yields are likely to increase as new production technology is developed. The productivity of a given soil compared with that of other soils, however, is not likely to change.

Crops other than those shown in table 5 are grown in the survey area, but estimated yields are not listed because the acreage of such crops is small. The local office of the Soil Conservation Service or of the Cooperative Extension Service can provide information about the management and productivity of the soils for those crops.

Land Capability Classification

Land capability classification shows, in a general way, the suitability of soils for most kinds of field crops. Crops that require special management are excluded. The soils are grouped according to their limitations for field crops, the risk of damage if they are used for crops, and the way they respond to management. The grouping does not take into account major and generally expensive landforming that would change slope, depth, or other characteristics of the soils, nor does it consider possible but unlikely major reclamation projects. Capability classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for rangeland, for woodland, and for engineering purposes.

In the capability system, soils are generally grouped at three levels: capability class, subclass, and unit. Only

class and subclass are used in this survey. These levels are defined in the following paragraphs.

Capability classes, the broadest groups, are designated by Roman numerals I through VIII. The numerals indicate progressively greater limitations and narrower choices for practical use. The classes are defined as follows:

Class I soils have few limitations that restrict their use.

Class II soils have moderate limitations that reduce the choice of plants or that require moderate conservation practices.

Class III soils have severe limitations that reduce the choice of plants or that require special conservation practices, or both.

Class IV soils have very severe limitations that reduce the choice of plants or that require very careful management, or both.

Class V soils are not likely to erode but have other limitations, impractical to remove, that limit their use.

Class VI soils have severe limitations that make them generally unsuitable for cultivation.

Class VII soils have very severe limitations that make them unsuitable for cultivation.

Class VIII soils and miscellaneous areas have limitations that nearly preclude their use for commercial crop production.

There is no class I or II land in this survey area because of the limited growing season. In this area, land with the fewest limitations for field crops is in class III.

Capability subclasses are soil groups within one class. They are designated by adding a small letter, *e, w, s,* or *c,* to the class numeral, for example, IIe. The letter *e* shows that the main limitation is risk of erosion unless close-growing plant cover is maintained; *w* shows that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); *s* shows that the soil is limited mainly because it is shallow, droughty, or stony; and *c*, used in only some parts of the United States, shows that the chief limitation is climate that is very cold or very dry.

In class I there are no subclasses because the soils of this class have few limitations. Class V contains only the subclasses indicated by *w, s,* or *c* because the soils in class V are subject to little or no erosion. They have other limitations that restrict their use to pasture, rangeland, woodland, wildlife habitat, or recreation.

The capability classification of each map unit is given in the section "Detailed Soil Map Units."

Rangeland

Livestock are important to the economy of this survey area. About 260,000 acres, or 90 percent, of the tribal land is used for livestock grazing. The amount of rangeland used for livestock grazing will decrease as more land is developed for other agricultural and urban uses.

Cow-calf operations are dominant. Cattle graze the range from April to November. A large number of horses owned by tribal members use the rangeland for year-round grazing.

In areas that have similar climate and topography, differences in the kind and amount of vegetation produced on rangeland are closely related to the kind of soil. Effective management is based on the relationship between the soils and vegetation and water (fig. 3).

Table 6 shows, for each soil, the range site; the total annual production of vegetation in favorable, normal, and unfavorable years; the characteristic vegetation; and the average percentage of each species. Only those soils that are used as rangeland or are suited to use as rangeland are listed. One map unit that is used as rangeland (Haploxeralfs-Durixeralfs-Rubble land complex, 20 to 50 percent slopes) is mapped more broadly and is not listed in the table. The section "Detailed Soil Map Units" provides a discussion of this unit. Explanation of the column headings in table 6 follows.

A *range site* is a distinctive kind of rangeland that produces a characteristic natural plant community that differs from natural plant communities on other range sites in kind, amount, and proportion of range plants. The relationship between soils and vegetation was established during this survey; thus, range sites generally can be determined directly from the soil map. Soil properties that affect moisture supply and plant nutrients have the greatest influence on the productivity of range plants. Soil reaction, salt content, and a seasonal water table are also important.

Total production is the amount of vegetation that can be expected to grow annually on well managed rangeland that is supporting the potential natural plant community. It includes all vegetation, whether or not it is palatable to grazing animals. It includes the current year's growth of leaves, twigs, and fruits of woody plants. It does not include the increase in stem diameter of trees and shrubs. It is expressed in pounds per acre of air-dry vegetation for favorable, normal, and unfavorable years. In a favorable year, the amount and distribution of precipitation and the temperatures make growing conditions substantially better than average. In a normal year, growing conditions are about average. In an unfavorable year, growing conditions are well below average, generally because of low available soil moisture.

Dry weight is the total annual yield per acre of air-dry vegetation. Yields are adjusted to a common percent of air-dry moisture content. The relationship of green weight to air-dry weight varies according to such factors as exposure, amount of shade, recent rains, and unseasonable dry periods.

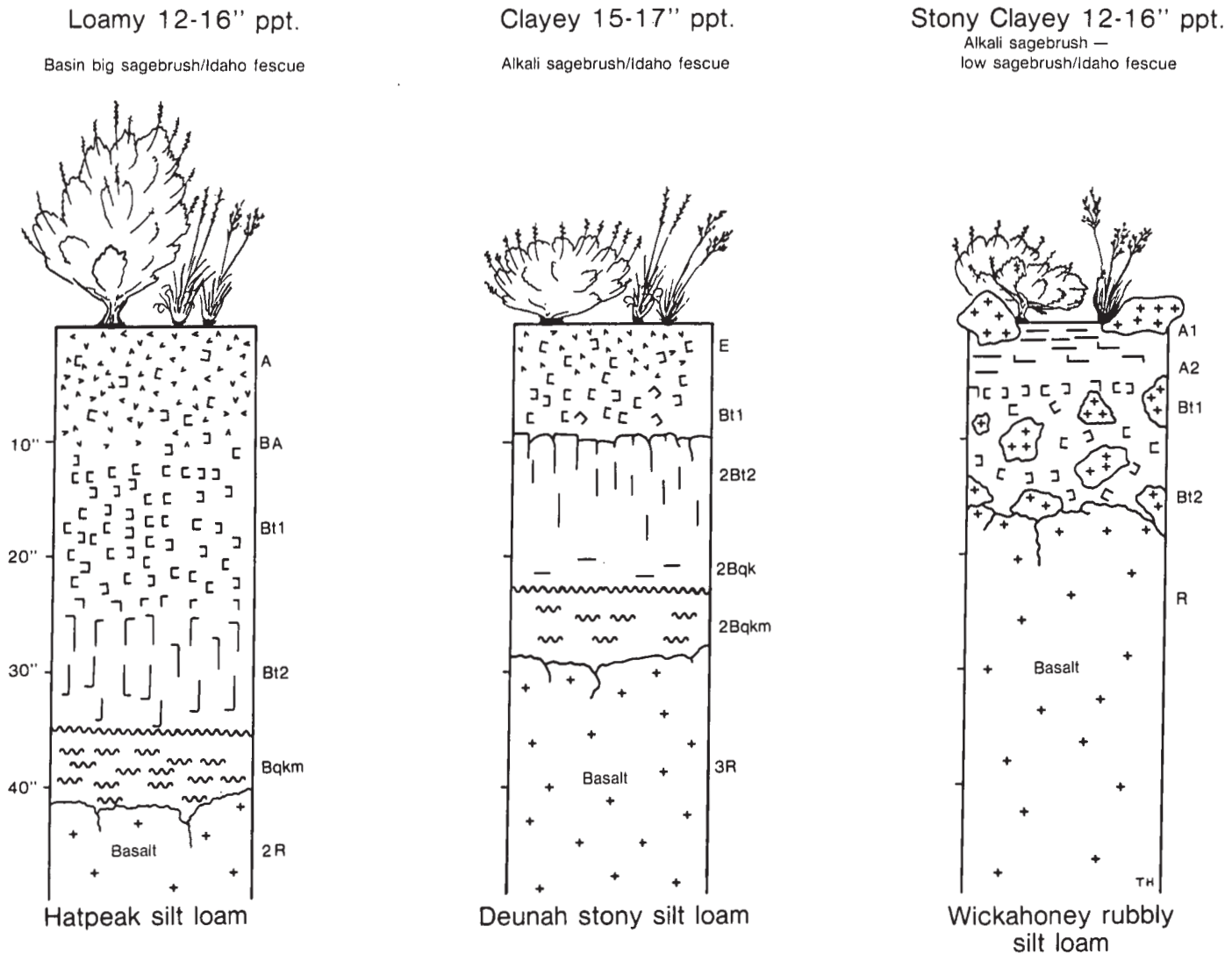


Figure 3.—Typical soils and vegetation in the major range sites of the basalt tablelands.

Characteristic vegetation—the grasses, forbs, and shrubs that make up most of the potential natural plant community on each soil—is listed by common name. Under *composition*, the expected percentage of the total annual production is given for each species making up the characteristic vegetation. The amount that can be used as forage depends on the kinds of grazing animals and on the grazing season.

Range management requires a knowledge of the kinds of soil and of the potential natural plant community. It also requires an evaluation of the present range condition. Range condition is determined by comparing the present plant community with the potential natural plant community on a particular range site. The more closely the existing community resembles the potential community, the better the range condition. Range condition is an ecological rating only.

An objective in range management is to control grazing so that the plants growing on a site are about the same in kind and amount as the potential natural plant community for that site. Such management generally results in the optimum production of vegetation, efficient use of water, and control of erosion. Sometimes, however, a range condition somewhat below the potential meets grazing needs, provides adequate wildlife habitat, and still protects soil and water resources.

About 70 percent of the rangeland in this survey area is considered to be in good to excellent condition. A primary concern is to manage livestock grazing so that the potential plant community is improved or maintained. If the range is overgrazed, the proportion of less preferred forage plants increases. Livestock grazing should be managed so that the desired balance of preferred forage species is maintained. Production of preferred perennial grasses and forbs can be increased by delaying spring grazing until the plants have achieved sufficient growth to withstand grazing and trampling by livestock. Specialized grazing systems that rest or defer specific pastures during the growing season of a given year allow key plants to complete their growth cycle uninterrupted and to replenish their carbohydrate reserves.

Developing livestock watering facilities, locating salt for livestock away from watering facilities, and fencing to achieve better livestock distribution are other important practices that can be used to improve rangeland. Management that improves or maintains the plant cover and promotes the accumulation of litter on the surface also reduces the risk of erosion and increases moisture infiltration.

Soils strongly influence the kind and amount of natural vegetation present. Most of the soils on the valley floor are loamy and very productive. Basin big sagebrush and Idaho fescue are the dominant range plants. The loamy soils have good potential for conversion to cropland. Some areas have a high water table and are subject to flooding. They support water tolerant plants such as silver sagebrush, sedges, and rushes. Grazing on these soils should be avoided during wet periods in spring. A few soils in the northern part of the area are affected by salts and support salt tolerant plants such as greasewood and saltgrasses.

The western and northeastern parts of the survey area are rocky basalt plateaus. The vegetation is mainly alkali sagebrush, low sagebrush, and Idaho fescue. Plant growth on the soils in these parts of the area is restricted by the heavy clay subsoil. Grazing in spring should be delayed until the soils are dry enough to withstand trampling and to allow sufficient plant growth, which prevents damage to important grasses.

On the high plateaus, hills, and mountains of the southern and eastern parts of the survey area, the soils generally are loamy and are cool in summer. The main kinds of vegetation are mountain big sagebrush, shrubs, and grasses and areas of aspen and subalpine fir. Small areas of wet and semiwet meadows are scattered across the high, eastern plateaus.

Sound rangeland management based on soil survey information and rangeland inventories is the basis for maintaining and improving rangeland productivity.

Windbreaks and Environmental Plantings

Windbreaks protect livestock, buildings, and yards from wind and snow. They also protect fruit trees and gardens, and they furnish habitat for wildlife. Several rows of low- and high-growing broadleaf and coniferous trees and shrubs provide the most protection.

Field windbreaks are narrow plantings made at right angles to the prevailing wind and at specific intervals across the field. The interval depends on the erodibility of the soil. Field windbreaks protect cropland and crops from wind, hold snow on the fields, and provide food and cover for wildlife.

Environmental plantings help to beautify and screen houses and other buildings and to abate noise. The plants, mostly evergreen shrubs and trees, are closely spaced. To insure plant survival, a healthy planting stock of suitable species should be planted properly on a well prepared site and maintained in good condition.

Table 7 shows the height that locally grown trees and shrubs are expected to reach in 20 years on various soils. The estimates in table 7 are based on measurements and observation of established plantings that have been given adequate care. They can be used as a guide in planning windbreaks and screens. Additional information on planning windbreaks and screens and planting and caring for trees and shrubs can be obtained from local offices of the Soil Conservation Service or the Cooperative Extension Service or from a nursery.

Recreation

The survey area provides many opportunities for outdoor recreation, primarily fishing, camping, and hunting.

Fishing for rainbow trout is very popular in Mountain View and Sheep Creek Reservoirs. Many fishermen come from outside the survey area, especially from the Boise and Twin Falls areas. Campgrounds on the shores of the reservoirs are heavily used by fishermen. Trout fishing is also available in the Owyhee River.

Hunting on the survey area is reserved for Indians. Mule deer are the most popular big game animals. Antelope also live in the area. Game birds in the area include sage grouse, chukar, quail, geese, and many kinds of ducks.

The soils of the survey area are rated in table 8 according to limitations that affect their suitability for recreation. The ratings are based on restrictive soil features, such as wetness, slope, and texture of the surface layer. Susceptibility to flooding is considered. Not considered in the ratings, but important in evaluating a site, are the location and accessibility of the area, the size and shape of the area and its scenic quality, vegetation, access to water, potential water impoundment sites, and access to public sewerlines. The

capacity of the soil to absorb septic tank effluent and the ability of the soil to support vegetation are also important. Soils subject to flooding are limited for recreation use by the duration and intensity of flooding and the season when flooding occurs. In planning recreation facilities, onsite assessment of the height, duration, intensity, and frequency of flooding is essential.

In table 8, the degree of soil limitation is expressed as slight, moderate, or severe. *Slight* means that soil properties are generally favorable and that limitations are minor and easily overcome. *Moderate* means that limitations can be overcome or alleviated by planning, design, or special maintenance. *Severe* means that soil properties are unfavorable and that limitations can be offset only by costly soil reclamation, special design, intensive maintenance, limited use, or by a combination of these measures.

The information in table 8 can be supplemented by other information in this survey, for example, interpretations for dwellings without basements and for local roads and streets in table 10 and interpretations for septic tank absorption fields in table 11.

Camp areas require site preparation such as shaping and leveling the tent and parking areas, stabilizing roads and intensively used areas, and installing sanitary facilities and utility lines. Camp areas are subject to heavy foot traffic and some vehicular traffic. The best soils have mild slopes and are not wet or subject to flooding during the period of use. The surface has few or no stones or boulders, absorbs rainfall readily but remains firm, and is not dusty when dry. Strong slopes and stones or boulders can greatly increase the cost of constructing campsites.

Picnic areas are subject to heavy foot traffic. Most vehicular traffic is confined to access roads and parking areas. The best soils for picnic areas are firm when wet, are not dusty when dry, are not subject to flooding during the period of use, and do not have slopes or stones or boulders that increase the cost of shaping sites or of building access roads and parking areas.

Playgrounds require soils that can withstand intensive foot traffic. The best soils are almost level and are not wet or subject to flooding during the season of use. The surface is free of stones and boulders, is firm after rains, and is not dusty when dry. If grading is needed, the depth of the soil over bedrock or a hardpan should be considered.

Wildlife Habitat

Soils affect the kind and amount of vegetation that is available to wildlife as food and cover. They also affect the construction of water impoundments. The kind and abundance of wildlife depend largely on the amount and distribution of food, cover, and water. Wildlife habitat can be created or improved by planting appropriate vegetation, by maintaining the existing plant cover, or by promoting the natural establishment of desirable plants.

In table 9, the soils in the survey area are rated according to their potential for providing habitat for various kinds of wildlife. This information can be used in planning parks, wildlife refuges, nature study areas, and other developments for wildlife; in selecting soils that are suitable for establishing, improving, or maintaining specific elements of wildlife habitat; and in determining the intensity of management needed for each element of the habitat.

The potential of the soil is rated good, fair, poor, or very poor. A rating of *good* indicates that the element or kind of habitat is easily established, improved, or maintained. Few or no limitations affect management, and satisfactory results can be expected. A rating of *fair* indicates that the element or kind of habitat can be established, improved, or maintained in most places. Moderately intensive management is required for satisfactory results. A rating of *poor* indicates that limitations are severe for the designated element or kind of habitat. Habitat can be created, improved, or maintained in most places, but management is difficult and must be intensive. A rating of *very poor* indicates that restrictions for the element or kind of habitat are very severe and that unsatisfactory results can be expected. Creating, improving, or maintaining habitat is impractical or impossible.

The elements of wildlife habitat are described in the following paragraphs.

Grain and seed crops are domestic grains and seed-producing herbaceous plants. Soil properties and features that affect the growth of grain and seed crops are depth of the root zone, texture of the surface layer, available water capacity, wetness, slope, surface stoniness, and flood hazard. Soil temperature and soil moisture are also considerations. Examples of grain and seed crops are corn, wheat, oats, and barley.

Grasses and legumes are domestic perennial grasses and herbaceous legumes. Soil properties and features that affect the growth of grasses and legumes are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, flood hazard, and slope. Soil temperature and soil moisture are also considerations. Examples of grasses and legumes are fescue, lovegrass, bromegrass, clover, and alfalfa.

Wild herbaceous plants are native or naturally established grasses and forbs, including weeds. Soil properties and features that affect the growth of these plants are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, and flood hazard. Soil temperature and soil moisture are also considerations. Examples of wild herbaceous plants are Idaho fescue, lupine, balsamroot, and bluebunch wheatgrass.

Shrubs are bushy woody plants that produce fruit, buds, twigs, bark, and foliage. Soil properties and

features that affect the growth of shrubs are depth of the root zone, available water capacity, salinity, and soil moisture. Examples of shrubs are serviceberry, snowbrush ceanothus, bitterbrush, snowberry, and big sagebrush.

Wetland plants are annual and perennial wild herbaceous plants that grow on moist or wet sites. Submerged or floating aquatic plants are excluded. Soil properties and features affecting wetland plants are texture of the surface layer, wetness, reaction, salinity, slope, and surface stoniness. Examples of wetland plants are smartweed, Rocky Mountain iris, blue camas, cordgrass, rushes, sedges, and reeds.

Shallow water areas have an average depth of less than 5 feet. Some are naturally wet areas. Others are created by dams, levees, or other water-control structures. Soil properties and features affecting shallow water areas are depth to bedrock, wetness, surface stoniness, slope, and permeability. Examples of shallow water areas are marshes, waterfowl feeding areas, and ponds.

The habitat for various kinds of wildlife is described in the following paragraphs.

Habitat for openland wildlife consists of cropland, pasture, meadows, and areas that are overgrown with grasses, herbs, shrubs, and vines. These areas produce grain and seed crops, grasses and legumes, and wild herbaceous plants. The wildlife attracted to these areas include meadowlark, sandhill crane, field sparrow, jackrabbit, and coyote.

Habitat for woodland wildlife consists of areas of deciduous plants and associated grasses, legumes, and wild herbaceous plants. Wildlife attracted to these areas include mule deer, forest grouse, squirrels, and songbirds.

Habitat for wetland wildlife consists of open, marshy or swampy shallow water areas. Some of the wildlife attracted to such areas are ducks, geese, herons, shore birds, muskrat, mink, and beaver.

Habitat for rangeland wildlife consists of areas of shrubs and wild herbaceous plants. Wildlife attracted to rangeland include antelope, deer, badger, sage grouse, meadowlark, California quail, and chukars.

Engineering

This section provides information for planning land uses related to urban development and to water management. Soils are rated for various uses, and the most limiting features are identified. The ratings are given in the following tables: Building Site Development, Sanitary Facilities, Construction Materials, and Water Management. The ratings are based on observed performance of the soils and on the estimated data and test data in the "Soil Properties" section.

Information in this section is intended for land use planning, for evaluating land use alternatives, and for planning site investigations prior to design and construction. The information, however, has limitations. For example, estimates and other data generally apply only to that part of the soil within a depth of 5 or 6 feet. Because of the map scale, small areas of different soils may be included within the mapped areas of a specific soil.

The information is not site specific and does not eliminate the need for onsite investigation of the soils or for testing and analysis by personnel experienced in the design and construction of engineering works.

Government ordinances and regulations that restrict certain land uses or impose specific design criteria were not considered in preparing the information in this section. Local ordinances and regulations need to be considered in planning, in site selection, and in design.

Soil properties, site features, and observed performance were considered in determining the ratings in this section. During the fieldwork for this soil survey, determinations were made about grain-size distribution, liquid limit, plasticity index, soil reaction, depth to bedrock, hardness of bedrock within 5 to 6 feet of the surface, soil wetness, depth to a seasonal high water table, slope, likelihood of flooding, natural soil structure aggregation, and soil density. Data were collected about kinds of clay minerals, mineralogy of the sand and silt fractions, and the kind of adsorbed cations. Estimates were made for erodibility, permeability, corrosivity, shrink-swell potential, available water capacity, and other behavioral characteristics affecting engineering uses.

This information can be used to (1) evaluate the potential of areas for residential, commercial, industrial, and recreation uses; (2) make preliminary estimates of construction conditions; (3) evaluate alternative routes for roads, streets, highways, pipelines, and underground cables; (4) evaluate alternative sites for sanitary landfills, septic tank absorption fields, and sewage lagoons; (5) plan detailed onsite investigations of soils and geology; (6) locate potential sources of gravel, sand, earthfill, and topsoil; (7) plan drainage systems, irrigation systems, ponds, terraces, and other structures for soil and water conservation; and (8) predict performance of proposed small structures and pavements by comparing the performance of existing similar structures on the same or similar soils.

The information in the tables, along with the soil maps and soil descriptions, and other data provided in this survey can be used to make additional interpretations.

Some of the terms used in this soil survey have a special meaning in soil science and are defined in the Glossary.

Building Site Development

Table 10 shows the degree and kind of soil limitations that affect shallow excavations, dwellings with and without basements, small commercial buildings, local

roads and streets, and lawns and landscaping. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required. Special feasibility studies may be required where the soil limitations are severe.

Shallow excavations are trenches or holes dug to a maximum depth of 5 or 6 feet for basements, graves, utility lines, open ditches, and other purposes. The ratings are based on soil properties, site features, and observed performance of the soils. The ease of digging, filling, and compacting is affected by the depth to bedrock, a cemented pan, or a very firm dense layer; stone content; soil texture; and slope. The time of the year that excavations can be made is affected by the depth to a seasonal high water table and the susceptibility of the soil to flooding. The resistance of the excavation walls or banks to sloughing or caving is affected by soil texture and the depth to the water table.

Dwellings and small commercial buildings are structures built on shallow foundations on undisturbed soil. The load limit is the same as that for single-family dwellings no higher than three stories. Ratings are made for small commercial buildings without basements, for dwellings with basements, and for dwellings without basements. The ratings are based on soil properties, site features, and observed performance of the soils. A high water table, flooding, shrink-swell potential, and organic layers can cause the movement of footings. A high water table, depth to bedrock or to a cemented pan, large stones, and flooding affect the ease of excavation and construction. Landscaping and grading that require cuts and fills of more than 5 to 6 feet are not considered.

Local roads and streets have an all-weather surface and carry automobile and light truck traffic all year. They have a subgrade of cut or fill soil material, a base of gravel, crushed rock, or stabilized soil material, and a flexible or rigid surface. Cuts and fills are generally limited to less than 6 feet. The ratings are based on soil properties, site features, and observed performance of the soils. Depth to bedrock or to a cemented pan, a high water table, flooding, large stones, and slope affect the ease of excavating and grading. Soil strength (as inferred from the engineering classification of the soil), shrink-swell potential, frost action potential, and depth to a high water table affect the traffic supporting capacity.

Lawns and landscaping require soils on which turf and ornamental trees and shrubs can be established and maintained. The ratings are based on soil properties, site features, and observed performance of the soils. Soil reaction, a high water table, depth to bedrock or to a cemented pan, the available water capacity in the upper 40 inches, and the content of salts, sodium, and sulfidic materials affect plant growth. Flooding, wetness, slope, stoniness, and the amount of sand, clay, or organic matter in the surface layer affect trafficability after vegetation is established.

Sanitary Facilities

Table 11 shows the degree and the kind of soil limitations that affect septic tank absorption fields, sewage lagoons, and sanitary landfills. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required.

Table 11 also shows the suitability of the soils for use as daily cover for landfills. A rating of *good* indicates that soil properties and site features are favorable for the use and good performance and low maintenance can be expected; *fair* indicates that soil properties and site features are moderately favorable for the use and one or more soil properties or site features make the soil less desirable than the soils rated good; and *poor* indicates that one or more soil properties or site features are unfavorable for the use and overcoming the unfavorable properties requires special design, extra maintenance, or costly alteration.

Septic tank absorption fields are areas in which effluent from a septic tank is distributed into the soil through subsurface tiles or perforated pipe. Only that part of the soil between depths of 24 and 72 inches is evaluated. The ratings are based on soil properties, site features, and observed performance of the soils. Permeability, a high water table, depth to bedrock or to a cemented pan, and flooding affect absorption of the effluent. Large stones and bedrock or a cemented pan interfere with installation.

Unsatisfactory performance of septic tank absorption fields, including excessively slow absorption of effluent, surfacing of effluent, and hillside seepage, can affect public health. Ground water can be polluted if highly permeable sand and gravel or fractured bedrock is less than 4 feet below the base of the absorption field, if slope is excessive, or if the water table is near the surface. There must be unsaturated soil material beneath the absorption field to filter the effluent effectively. Many local ordinances require that this material be of a certain thickness.

Sewage lagoons are shallow ponds constructed to hold sewage while aerobic bacteria decompose the solid and liquid wastes. Lagoons should have a nearly level floor surrounded by cut slopes or embankments of compacted soil. Lagoons generally are designed to hold the sewage within a depth of 2 to 5 feet. Nearly impervious soil material for the lagoon floor and sides is required to minimize seepage and contamination of ground water.

Table 11 gives ratings for the natural soil that makes up the lagoon floor. The surface layer and, generally, 1 or 2 feet of soil material below the surface layer are excavated to provide material for the embankments. The ratings are based on soil properties, site features, and observed performance of the soils. Considered in the ratings are slope, permeability, a high water table, depth to bedrock or to a cemented pan, flooding, large stones, and content of organic matter.

Excessive seepage because of rapid permeability of the soil or a water table that is high enough to raise the level of sewage in the lagoon causes a lagoon to function unsatisfactorily. Pollution results if seepage is excessive or if floodwater overtops the lagoon. A high content of organic matter is detrimental to proper functioning of the lagoon because it inhibits aerobic activity. Slope, bedrock, and cemented pans can cause construction problems, and large stones can hinder compaction of the lagoon floor.

Sanitary landfills are areas where solid waste is disposed of by burying it in soil. There are two types of landfill—trench and area. In a trench landfill, the waste is placed in a trench. It is spread, compacted, and covered daily with a thin layer of soil excavated at the site. In an area landfill, the waste is placed in successive layers on the surface of the soil. The waste is spread, compacted, and covered daily with a thin layer of soil from a source away from the site.

Both types of landfill must be able to bear heavy vehicular traffic. Both types involve a risk of ground water pollution. Ease of excavation and revegetation needs to be considered.

The ratings in table 11 are based on soil properties, site features, and observed performance of the soils. Permeability, depth to bedrock or to a cemented pan, a high water table, slope, and flooding affect both types of landfill. Texture, stones and boulders, highly organic layers, soil reaction, and content of salts and sodium affect trench type landfills. Unless otherwise stated, the ratings apply only to that part of the soil within a depth of about 6 feet. For deeper trenches, a limitation rated slight or moderate may not be valid. Onsite investigation is needed.

Daily cover for landfill is the soil material that is used to cover compacted solid waste in an area type sanitary landfill. The soil material is obtained offsite, transported to the landfill, and spread over the waste.

Soil texture, wetness, coarse fragments, and slope affect the ease of removing and spreading the material during wet and dry periods. Loamy or silty soils that are free of large stones or excess gravel are the best cover for a landfill. Clayey soils are sticky or cloddy and are difficult to spread; sandy soils are subject to wind erosion.

After soil material has been removed, the soil material remaining in the borrow area must be thick enough over bedrock, a cemented pan, or the water table to permit revegetation. The soil material used as final cover for a landfill should be suitable for plants. The surface layer generally has the best workability, more organic matter, and the best potential for plants. Material from the surface layer should be stockpiled for use as the final cover.

Construction Materials

Table 12 gives information about the soils as a source of roadfill, sand, gravel, and topsoil. The soils are rated *good, fair,* or *poor* as a source of roadfill and topsoil. They are rated as a probable or improbable source of sand and gravel. The ratings are based on soil properties and site features that affect the removal of the soil and its use as construction material. Normal compaction, minor processing, and other standard construction practices are assumed. Each soil is evaluated to a depth of 5 or 6 feet.

Roadfill is soil material that is excavated in one place and used in road embankments in another place. In this table, the soils are rated as a source of roadfill for low embankments, generally less than 6 feet high and less exacting in design than higher embankments.

The ratings are for the soil material below the surface layer to a depth of 5 or 6 feet. It is assumed that soil layers will be mixed during excavating and spreading. Many soils have layers of contrasting suitability within their profile. The table showing engineering index properties provides detailed information about each soil layer. This information can help determine the suitability of each layer for use as roadfill. The performance of soil after it is stabilized with lime or cement is not considered in the ratings.

The ratings are based on soil properties, site features, and observed performance of the soils. The thickness of suitable material is a major consideration. The ease of excavation is affected by large stones, a high water table, and slope. How well the soil performs in place after it has been compacted and drained is determined by its strength (as inferred from the engineering classification of the soil) and shrink-swell potential.

Soils rated *good* contain significant amounts of sand or gravel or both. They have at least 5 feet of suitable material, low shrink-swell potential, few cobbles and stones, and slopes of 15 percent or less. Depth to the water table is more than 3 feet. Soils rated *fair* are more

than 35 percent silt- and clay-sized particles and have a plasticity index of less than 10. They have moderate shrink-swell potential, slopes of 15 to 25 percent, or many stones. Depth to the water table is 1 to 3 feet. Soils rated *poor* have a plasticity index of more than 10, a high shrink-swell potential, many stones, or slopes of more than 25 percent. They are wet, and the depth to the water table is less than 1 foot. They may have layers of suitable material, but the material is less than 3 feet thick.

Sand and gravel are natural aggregates suitable for commercial use with a minimum of processing. Sand and gravel are used in many kinds of construction. Specifications for each use vary widely. In table 12, only the probability of finding material in suitable quantity is evaluated. The suitability of the material for specific purposes is not evaluated, nor are factors that affect excavation of the material.

The properties used to evaluate the soil as a source of sand or gravel are gradation of grain sizes (as indicated by the engineering classification of the soil), the thickness of suitable material, and the content of rock fragments. Kinds of rock, acidity, and stratification are given in the soil series descriptions. Gradation of grain sizes is given in the table on engineering index properties.

A soil rated as a probable source has a layer of clean sand or gravel or a layer of sand or gravel that is as much as 12 percent silty fines. This material must be at least 3 feet thick and less than 50 percent, by weight, large stones. All other soils are rated as an improbable source. Coarse fragments of soft bedrock, such as shale and siltstone, are not considered to be sand and gravel.

Topsoil is used to cover an area so that vegetation can be established and maintained. The upper 40 inches of a soil is evaluated for use as topsoil. Also evaluated is the reclamation potential of the borrow area.

Plant growth is affected by toxic material and by such properties as soil reaction, available water capacity, and fertility. The ease of excavating, loading, and spreading is affected by rock fragments, slope, a water table, soil texture, and thickness of suitable material. Reclamation of the borrow area is affected by slope, a water table, rock fragments, bedrock, and toxic material.

Soils rated *good* have friable loamy material to a depth of at least 40 inches. They are free of stones and cobbles, have little or no gravel, and have slopes of less than 8 percent. They are low in content of soluble salts, are naturally fertile or respond well to fertilizer, and are not so wet that excavation is difficult.

Soils rated *fair* are sandy soils, loamy soils that have a relatively high content of clay, soils that have only 20 to 40 inches of suitable material, soils that have an appreciable amount of gravel, stones, or soluble salts, or soils that have slopes of 8 to 15 percent. The soils are not so wet that excavation is difficult.

Soils rated *poor* are very sandy or clayey, have less than 20 inches of suitable material, have a large amount of gravel, stones, or soluble salts, have slopes of more than 15 percent, or have a seasonal water table at or near the surface.

The surface layer of most soils is generally preferred for topsoil because of its organic matter content. Organic matter greatly increases the absorption and retention of moisture and nutrients for plant growth.

Water Management

Table 13 gives information on the soil properties and site features that affect water management. The degree and kind of soil limitations are given for pond reservoir areas; embankments, dikes, and levees; and aquifer-fed ponds. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and are easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increase in construction costs, and possibly increased maintenance are required.

This table also gives for each soil the restrictive features that affect drainage, irrigation, and grassed waterways.

Pond reservoir areas hold water behind a dam or embankment. Soils best suited to this use have low seepage potential in the upper 60 inches. The seepage potential is determined by the permeability of the soil and the depth to fractured bedrock or other permeable material. Excessive slope can affect the storage capacity of the reservoir area.

Embankments, dikes, and levees are raised structures of soil material, generally less than 20 feet high, constructed to impound water or to protect land against overflow. In this table, the soils are rated as a source of material for embankment fill. The ratings apply to the soil material below the surface layer to a depth of about 5 feet. It is assumed that soil layers will be uniformly mixed and compacted during construction.

The ratings do not indicate the ability of the natural soil to support an embankment. Soil properties to a depth even greater than the height of the embankment can affect performance and safety of the embankment. Generally, deeper onsite investigation is needed to determine these properties.

Soil material in embankments must be resistant to seepage, piping, and erosion and have favorable compaction characteristics. Unfavorable features include less than 5 feet of suitable material and a high content of stones or boulders, organic matter, or salts or sodium.

A high water table affects the amount of usable material. It also affects trafficability.

Aquifer-fed excavated ponds are pits or dugouts that extend to a ground water aquifer or to a depth below a permanent water table. Excluded are ponds that are fed only by surface runoff and embankment ponds that impound water 3 feet or more above the original surface. Excavated ponds are affected by depth to a permanent water table, permeability of the aquifer, and quality of the water as inferred from the salinity of the soil. Depth to bedrock and the content of large stones affect the ease of excavation.

Drainage is the removal of excess surface and subsurface water from the soil. How easily and effectively the soil is drained depends on the depth to bedrock, to a cemented pan, or to other layers that affect the rate of water movement; permeability; depth to a high water table or depth of standing water if the soil is subject to ponding; slope; susceptibility to flooding; subsidence of organic layers; and potential frost action. Excavating and grading and the stability of ditchbanks are affected by depth to bedrock or to a cemented pan, large stones, slope, and the hazard of cutbanks caving. The productivity of the soil after drainage is adversely affected by extreme acidity or by toxic substances in the root zone, such as salts, sodium, or sulfur. Availability of drainage outlets is not considered in the ratings.

Irrigation is the controlled application of water to supplement rainfall and support plant growth. The design and management of an irrigation system are affected by depth to the water table, the need for drainage, flooding, available water capacity, intake rate, permeability, erosion hazard, and slope. The construction of a system is affected by large stones and depth to bedrock or to a cemented pan. The performance of a system is affected by the depth of the root zone, the amount of salts or sodium, and soil reaction.

Grassed waterways are natural or constructed channels, generally broad and shallow, that conduct surface water to outlets at a nonerosive velocity. Large stones, wetness, slope, and depth to bedrock or to a cemented pan affect the construction of grassed waterways. A hazard of wind erosion, low available water capacity, restricted rooting depth, toxic substances such as salts or sodium, and restricted permeability adversely affect the growth and maintenance of the grass after construction.

Soil Properties

Data relating to soil properties are collected during the course of the soil survey. The data and the estimates of soil and water features listed in tables are explained on the following pages.

Estimates of soil properties are based on field examinations, on laboratory tests of samples from the survey area, and on laboratory tests of samples of similar soils in nearby areas. Tests verify field observations, verify properties that cannot be estimated accurately by field observation, and help characterize key soils.

The estimates of soil properties shown in the tables include the range of grain-size distribution and Atterberg limits, the engineering classifications, and the physical and chemical properties of the major layers of each soil. Pertinent soil and water features also are given.

Engineering Index Properties

Table 14 gives estimates of the engineering classification and of the range of index properties for the major layers of each soil in the survey area. Most soils have layers of contrasting properties within the upper 5 or 6 feet.

Depth to the upper and lower boundaries of each layer is indicated. The range in depth and information on other properties of each layer are given for each soil series under "Taxonomic Units and Their Morphology."

Texture is given in the standard terms used by the U.S. Department of Agriculture. These terms are defined according to percentages of sand, silt, and clay in the fraction of the soil that is less than 2 millimeters in diameter. "Loam," for example, is soil that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If the content of particles coarser than sand is as much as 15 percent, an appropriate modifier is added, for example, "gravelly." Textural terms are defined in the Glossary.

Classification of the soils is determined according to the system adopted by the American Association of State Highway and Transportation Officials (*1*) and the Unified soil classification system (*2*).

The Unified system classifies soils according to properties that affect their use as construction material. Soils are classified according to grain-size distribution of the fraction less than 3 inches in diameter and according to plasticity index, liquid limit, and organic matter content. Sandy and gravelly soils are identified as GW, GP, GM, GC, SW, SP, SM, and SC; silty and clayey soils as ML, CL, OL, MH, CH, and OH; and highly organic soils as PT. Soils exhibiting engineering properties of two groups can have a dual classification, for example, SP-SM.

The AASHTO system classifies soils according to those properties that affect roadway construction and maintenance. In this system, the fraction of a mineral soil that is less than 3 inches in diameter is classified in one of seven groups from A-1 through A-7 on the basis of grain-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines (silt and clay). At the other extreme, soils in group A-7 are fine grained. Highly organic soils are classified in group A-8 on the basis of visual inspection.

Rock fragments larger than 3 inches in diameter are indicated as a percentage of the total soil on a dry-weight basis. The percentages are estimates determined mainly by converting volume percentage in the field to weight percentage.

Percentage (of soil particles) passing designated sieves is the percentage of the soil fraction less than 3 inches in diameter based on an ovendry weight. The sieves, numbers 4, 10, 40, and 200 (USA Standard Series), have openings of 4.76, 2.00, 0.420, and 0.074 millimeters, respectively. Estimates are based on laboratory tests of soils sampled in the survey area and in nearby areas and on estimates made in the field.

Liquid limit and *plasticity index* (Atterberg limits) indicate the plasticity characteristics of a soil. The estimates are based on test data from the survey area or from nearby areas and on field examination.

The estimates of grain-size distribution, liquid limit, and plasticity index are rounded to the nearest 5 percent. Thus, if the ranges of gradation and Atterberg limits extend a marginal amount (1 or 2 percentage points) across classification boundaries, the classification in the marginal zone is omitted in the table.

Physical and Chemical Properties

Table 15 shows estimates of some characteristics and features that affect soil behavior. These estimates are given for the major layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Depth to the upper and lower boundaries of each layer is indicated. The range in depth and information on other properties of each layer are given for each soil series under "Taxonomic Units and Their Morphology."

Clay as a soil separate consists of mineral soil particles that are less than 0.002 millimeter in diameter. In this table, the estimated clay content of each major soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The amount and kind of clay greatly affect the fertility and physical condition of the soil. They determine the ability of the soil to adsorb cations and to retain moisture. They influence shrink-swell potential, permeability, and plasticity, the ease of soil dispersion, and other soil properties. The amount and kind of clay in a soil also affect tillage and earth-moving operations.

Moist bulk density is the weight of soil (ovendry) per unit volume. Volume is measured when the soil is at field moisture capacity, that is, the moisture content at 1/3 bar moisture tension. Weight is determined after drying the soil at 105 degrees C. In this table, the estimated moist bulk density of each major soil horizon is expressed in grams per cubic centimeter of soil material that is less than 2 millimeters in diameter. Bulk density data are used to compute shrink-swell potential, available water capacity, total pore space, and other soil properties. The moist bulk density of a soil indicates the pore space available for water and roots. A bulk density of more than 1.6 can restrict water storage and root penetration. Moist bulk density is influenced by texture, kind of clay, content of organic matter, and soil structure.

Permeability refers to the ability of a soil to transmit water or air. The estimates indicate the rate of downward movement of water when the soil is saturated. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Permeability is considered in the design of soil drainage systems, septic tank absorption yields, and construction where the rate of water movement under saturated conditions affects behavior.

Available water capacity refers to the quantity of water that the soil is capable of storing for use by plants. The capacity for water storage is given in inches of water per inch of soil for each major soil layer. The capacity varies, depending on soil properties that affect the retention of water and the depth of the root zone. The most important properties are the content of organic matter, soil texture, bulk density, and soil structure. Available water capacity is an important factor in the choice of plants or crops to be grown and in the design and management of irrigation systems. Available water capacity is not an estimate of the quantity of water actually available to plants at any given time.

Soil reaction is a measure of acidity or alkalinity and is expressed as a range in pH values. The range in pH of each major horizon is based on many field tests. For many soils, values have been verified by laboratory analyses. Soil reaction is important in selecting crops and other plants, in evaluating soil amendments for fertility and stabilization, and in determining the risk of corrosion.

Salinity is a measure of soluble salts in the soil at saturation. It is expressed as the electrical conductivity of the saturation extract, in millimhos per centimeter at 25 degrees C. Estimates are based on field and laboratory measurements at representative sites of nonirrigated soils. The salinity of irrigated soils is affected by the quality of the irrigation water and by the frequency of water application. Hence, the salinity of soils in individual fields can differ greatly from the value given in the table. Salinity affects the suitability of a soil for crop production, the stability of the soil if used as construction material, and the potential of the soil to corrode metal and concrete.

Shrink-swell potential is the potential for volume change in a soil with a loss or gain in moisture. Volume change occurs mainly because of the interaction of clay minerals with water and varies with the amount and type of clay minerals in the soil. The size of the load on the soil and the magnitude of the change in soil moisture content influence the amount of swelling of soils in place. Laboratory measurements of swelling of undisturbed clods were made for many soils. For others, swelling was estimated on the basis of the kind and amount of clay minerals in the soil and on measurements of similar soils.

If the shrink-swell potential is rated moderate or high, shrinking and swelling can cause damage to buildings, roads, and other structures. Special design is often needed.

Shrink-swell potential classes are based on the change in length of an unconfined clod as moisture content is increased from air-dry to field capacity. The change is based on the soil fraction less than 2 millimeters in diameter. The classes are *low*, a change of less than 3 percent; *moderate*, 3 to 6 percent; and *high*, more than 6 percent.

Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, very fine sand, sand, and organic matter (up to 4 percent) and on soil structure and permeability. The estimates are modified by the presence of rock fragments. Values of K range from 0.02 to 0.69. The higher the value the more susceptible the soil is to sheet and rill erosion by water.

Erosion factor T is an estimate of the maximum average annual rate of soil erosion by wind or water that can occur without affecting crop productivity over a sustained period. The rate is in tons per acre per year.

Wind erodibility groups are made up of soils that have similar properties affecting their resistance to wind

erosion in cultivated areas. The groups indicate the susceptibility of soil to wind erosion and the amount of soil lost. Soils are grouped according to the amount of stable aggregates 0.84 millimeters in size. These are represented idealistically by USDA textural classes. Soils containing rock fragments can occur in any group.

1. Sands, fine sands, and very fine sands. These soils are generally not suitable for crops. They are extremely erodible, and vegetation is difficult to establish.
2. Loamy sands, loamy fine sands, and loamy very fine sands. These soils are very highly erodible. Crops can be grown if intensive measures to control wind erosion are used.
3. Sandy loams, coarse sandy loams, fine sandy loams, and very fine sandy loams. These soils are highly erodible. Crops can be grown if intensive measures to control wind erosion are used.

4L. Calcareous loamy soils that are less than 35 percent clay and more than 5 percent finely divided calcium carbonate. These soils are erodible. Crops can be grown if intensive measures to control wind erosion are used.

4. Clays, silty clays, clay loams, and silty clay loams that are more than 35 percent clay. These soils are moderately erodible. Crops can be grown if measures to control wind erosion are used.
5. Loamy soils that are less than 18 percent clay and less than 5 percent finely divided calcium carbonate and sandy clay loams and sandy clays that are less than 5 percent finely divided calcium carbonate. These soils are slightly erodible. Crops can be grown if measures to control wind erosion are used.
6. Loamy soils that are 18 to 35 percent clay and less than 5 percent finely divided calcium carbonate, except silty clay loams. These soils are very slightly erodible. Crops can easily be grown.
7. Silty clay loams that are less than 35 percent clay and less than 5 percent finely divided calcium carbonate. These soils are very slightly erodible. Crops can easily be grown.
8. Stony or gravelly soils and other soils not subject to wind erosion.

Organic matter is the plant and animal residue in the soil at various stages of decomposition.

In table 15, the estimated content of organic matter is expressed as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of organic matter of a soil can be maintained or increased by returning crop residue to the soil. Organic matter affects the available water capacity, infiltration rate, and tilth. It is a source of nitrogen and other nutrients for crops.

Soil and Water Features

Table 16 gives estimates of various water features. The estimates are used in land use planning that involves engineering considerations.

Hydrologic soil groups are used to estimate runoff from precipitation. Soils not protected by vegetation are assigned to one of four groups. They are grouped according to the intake of water when the soils are thoroughly wet and receive precipitation from long-duration storms.

The four hydrologic soil groups are:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a permanent high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

Flooding, the temporary inundation of an area, is caused by overflowing streams, by runoff from adjacent slopes, or by tides. Water standing for short periods after rainfall or snowmelt is not considered flooding, nor is water in swamps and marshes.

Table 16 gives the frequency and duration of flooding and the time of year when flooding is most likely.

Frequency, duration, and probable dates of occurrence are estimated. Frequency is expressed as none, rare, common, occasional, and frequent. *None* means that flooding is not probable; *rare* that it is unlikely but possible under unusual weather conditions; *common* that it is likely under normal conditions; *occasional* that it occurs, on the average, no more than once in 2 years; and *frequent* that it occurs, on the average, more than once in 2 years. Duration is expressed as *very brief* if less than 2 days, *brief* if 2 to 7 days, and *long* if more than 7 days. Probable dates are expressed in months; November-May, for example, means that flooding can occur during the period November through May.

The information is based on evidence in the soil profile, namely thin strata of gravel, sand, silt, or clay

deposited by floodwater; irregular decrease in organic matter content with increasing depth; and absence of distinctive horizons that form in soils that are not subject to flooding.

Also considered are local information about the extent and levels of flooding and the relation of each soil on the landscape to historic floods. Information on the extent of flooding based on soil data is less specific than that provided by detailed engineering surveys that delineate flood-prone areas at specific flood frequency levels.

High water table (seasonal) is the highest level of a saturated zone in the soil in most years. The depth to a seasonal high water table applies to undrained soils. The estimates are based mainly on the evidence of a saturated zone, namely grayish colors or mottles in the soil. Indicated in table 16 are the depth to the seasonal high water table; the kind of water table—that is, perched, artesian, or apparent; and the months of the year that the water table commonly is high. A water table that is seasonally high for less than 1 month is not indicated in the table.

An *apparent* water table is a thick zone of free water in the soil. It is indicated by the level at which water stands in an uncased borehole after adequate time is allowed for adjustment in the surrounding soil. An *artesian* water table is under hydrostatic head, generally beneath an impermeable layer. When this layer is penetrated, the water level rises in an uncased borehole. A *perched* water table is water standing above an unsaturated zone. In places an upper, or perched, water table is separated from a lower one by a dry zone.

Only saturated zones within a depth of about 6 feet are indicated. A plus sign preceding the range in depth indicates that the water table is above the surface of the soil. The first numeral in the range indicates how high the water rises above the surface. The second numeral indicates the depth below the surface.

Table 17 gives estimates of various soil features. The estimates are used in land use planning that involves engineering considerations.

Depth to bedrock is given if bedrock is within a depth of 5 feet. The depth is based on many soil borings and on observations during soil mapping. The rock is specified as either soft or hard. If the rock is soft or fractured, excavations can be made with trenching machines, backhoes, or small rippers. If the rock is hard or massive, blasting or special equipment generally is needed for excavation.

Cemented pans are cemented or indurated subsurface layers within a depth of 5 feet. Such pans cause difficulty in excavation. Pans are classified as thin or thick. A *thin* pan is less than 3 inches thick if continuously indurated or less than 18 inches thick if discontinuous or fractured. Excavations can be made by trenching machines, backhoes, or small rippers. A *thick* pan is more than 3 inches thick if continuously indurated or more than 18 inches thick if discontinuous or fractured. Such a pan is so thick or massive that blasting or special equipment is needed in excavation.

Potential frost action is the likelihood of upward or lateral expansion of the soil caused by the formation of segregated ice lenses (frost heave) and the subsequent collapse of the soil and loss of strength on thawing. Frost action occurs when moisture moves into the freezing zone of the soil. Temperature, texture, density, permeability, content of organic matter, and depth to the water table are the most important factors considered in evaluating the potential for frost action. It is assumed that the soil is not insulated by vegetation or snow and is not artificially drained. Silty and highly structured clayey soils that have a high water table in winter are most susceptible to frost action. Well drained, very gravelly, or very sandy soils are the least susceptible. Frost heave and low soil strength during thawing cause damage mainly to pavements and other rigid structures.

Risk of corrosion pertains to potential soil-induced electrochemical or chemical action that dissolves or weakens uncoated steel or concrete. The rate of corrosion of uncoated steel is related to such factors as soil moisture, particle-size distribution, acidity, and electrical conductivity of the soil. The rate of corrosion of concrete is based mainly on the sulfate and sodium content, texture, moisture content, and acidity of the soil. Special site examination and design may be needed if the combination of factors creates a severe corrosion environment. The steel in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than steel in installations that are entirely within one kind of soil or within one soil layer.

For uncoated steel, the risk of corrosion, expressed as *low*, *moderate*, or *high*, is based on soil drainage class, total acidity, electrical resistivity near field capacity, and electrical conductivity of the saturation extract.

For concrete, the risk of corrosion is also expressed as *low*, *moderate*, or *high*. It is based on soil texture, acidity, and amount of sulfates in the saturation extract.

Classification of the Soils

The system of soil classification used by the National Cooperative Soil Survey has six categories (*9*). Beginning with the broadest, these categories are the order, suborder, great group, subgroup, family, and series. Classification is based on soil properties observed in the field or inferred from those observations or from laboratory measurements. Table 18 shows the classification of the soils in the survey area. The categories are defined in the following paragraphs.

ORDER. Ten soil orders are recognized. The differences among orders reflect the dominant soil-forming processes and the degree of soil formation. Each order is identified by a word ending in *sol*. An example is Entisol.

SUBORDER. Each order is divided into suborders primarily on the basis of properties that influence soil genesis and are important to plant growth or properties that reflect the most important variables within the orders. The last syllable in the name of a suborder indicates the order. An example is Aquent (*Aqu*, meaning water, plus *ent*, from Entisol).

GREAT GROUP. Each suborder is divided into great groups on the basis of close similarities in kind, arrangement, and degree of development of pedogenic horizons; soil moisture and temperature regimes; and base status. Each great group is identified by the name of a suborder and by a prefix that indicates a property of the soil. An example is Haplaquents (*Hapl*, meaning minimal horizonation, plus *aquent*, the suborder of the Entisols that have an aquic moisture regime).

SUBGROUP. Each great group has a typic subgroup. Other subgroups are intergrades or extragrades. The typic is the central concept of the great group; it is not necessarily the most extensive. Intergrades are transitions to other orders, suborders, or great groups. Extragrades have some properties that are not representative of the great group but do not indicate transitions to any other known kind of soil. Each subgroup is identified by one or more adjectives preceding the name of the great group. The adjective *Typic* identifies the subgroup that typifies the great group. An example is Typic Haplaquents.

FAMILY. Families are established within a subgroup on the basis of physical and chemical properties and other characteristics that affect management. Mostly the properties are those of horizons below plow depth where there is much biological activity. Among the properties and characteristics considered are particle-size class, mineral content, temperature regime, depth of the root zone, consistence, moisture equivalent, slope, and permanent cracks. A family name consists of the name of a subgroup preceded by terms that indicate soil properties. An example is fine-loamy, mixed, nonacid, mesic Typic Haplaquents.

SERIES. The series consists of soils that have similar horizons in their profile. The horizons are similar in color, texture, structure, reaction, consistence, mineral and chemical composition, and arrangement in the profile. The texture of the surface layer or of the substratum can differ within a series.

Taxonomic Units and Their Morphology

In this section, each soil series recognized in the survey area is described. The descriptions are arranged in alphabetic order.

Characteristics of the soil and the material in which it formed are identified for each series. A pedon, a small three-dimensional area of soil, that is typical of the series in the survey area is described. The detailed description of each soil horizon follows standards in the *Soil Survey Manual* (*8*). Many of the technical terms used in the descriptions are defined in *Soil Taxonomy* (*9*). Unless otherwise stated, colors in the descriptions are for dry soil. Following the pedon description is the range of important characteristics of the soils in the series.

The map units of each soil series are described in the section "Detailed Soil Map Units."

Arbidge Series

The Arbidge series consists of well drained soils on alluvial terraces. These soils are moderately deep to a duripan. They formed in local alluvium derived from basalt and rhyolite. Slope is 2 to 8 percent. Elevation is 5,220 to 5,350 feet. Average annual precipitation is about 13 inches, and average annual air temperature is about 45 degrees F.

These soils are fine-loamy, mixed, mesic Xerollic Durargids.

Typical pedon of an Arbidge silt loam in an area of Bedstead-Arbidge association, 2 to 15 percent slopes,

about 850 feet south and 350 feet west of the northeast corner of sec. 7, T. 15 S., R. 2 W., Owyhee County, Idaho.

A—0 to 3 inches; grayish brown (10YR 5/2) silt loam, dark brown (10YR 3/3) moist; moderate medium and coarse platy structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine and fine roots and few medium and coarse roots; many very fine and few medium vesicular pores; 5 percent pebbles; neutral (pH 6.6); clear smooth boundary.

Bt1—3 to 10 inches; brown (10YR 5/3) clay loam, brown (10YR 4/3) moist; weak fine and medium subangular blocky structure; slightly hard, friable, sticky and plastic; many very fine and fine roots, common medium roots, and few coarse roots; many very fine and fine tubular pores; common moderately thick clay films on faces of peds; 5 percent pebbles; neutral (pH 6.9); clear smooth boundary.

Bt2—10 to 19 inches; pale brown (10YR 6/3) clay loam, dark yellowish brown (10YR 4/4) moist; moderate fine subangular blocky structure; hard, friable, sticky and plastic; many very fine and fine roots and few medium roots; many fine tubular pores; many moderately thick clay films on faces of peds; 5 percent pebbles; mildly alkaline (pH 7.4); clear wavy boundary.

Bq—19 to 25 inches; light yellowish brown (10YR 6/4) gravelly loam, brown (10YR 5/3) moist; moderate medium and fine subangular blocky structure; hard, friable, slightly sticky and slightly plastic; common very fine and fine roots and few medium roots; common fine tubular pores; 15 percent pebbles; mildly alkaline (pH 7.8); clear wavy boundary.

Bkq—25 to 30 inches; pale brown (10YR 6/3) gravelly sandy loam, brown (10YR 5/3) moist; weak fine and medium subangular blocky structure; soft, very friable; common very fine and fine roots; common very fine and fine tubular pores; 35 percent pebbles; strongly effervescent; moderately alkaline (pH 8.3); abrupt wavy boundary.

2Bkqm—30 to 38 inches; very pale brown (10YR 8/3) indurated duripan; massive; extremely hard, brittle; continuous laminar opal cap 1/8 to 1 inch thick; 65 percent coarse fragments; violently effervescent; clear wavy boundary.

3Ckq—38 to 60 inches; variegated sand and pebbles; massive; lime and silica coatings on undersides of coarse fragments.

Secondary lime is at a depth of 12 to 25 inches. The duripan is at a depth of 20 to 36 inches. Bedrock is at a depth of 60 inches or more.

Argixerolls

Argixerolls consist of shallow to very deep, well drained soils on canyon foot slopes. These soils formed in colluvium and alluvium derived from basalt. Slope is 25 to 50 percent. Elevation is 5,190 to 7,000 feet. Average annual precipitation is 13 to 18 inches, and average annual air temperature is 40 to 45 degrees F.

Reference pedon of Argixerolls in an area of Rubble land-Rock outcrop-Argixerolls complex, 25 to 95 percent slopes, about 1,815 feet north and 825 feet east of the southwest corner of sec. 33, T. 14 S., R. 4 E., Owyhee County, Idaho.

A—0 to 4 inches; grayish brown (10YR 5/2) loam, very dark brown (10YR 2/2) moist; weak thin platy structure parting to weak fine granular; slightly hard, very friable, slightly sticky and slightly plastic; many fine and very fine roots; many very fine and fine interstitial pores; neutral (pH 7.1); clear smooth boundary.

AB—4 to 11 inches; brown (10YR 5/3) loam, very dark grayish brown (10YR 3/2) moist; moderate fine and medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; common very fine and fine roots; many very fine and fine tubular pores; neutral (pH 6.7); clear wavy boundary.

Bt—11 to 24 inches; light yellowish brown (10YR 6/4) clay loam, dark yellowish brown (10YR 4/4) moist; strong medium angular blocky structure; hard, firm, sticky and plastic; many very fine and fine roots; many fine tubular pores; many moderately thick clay films on faces of peds; neutral (pH 7.0); clear wavy boundary.

Bql—24 to 34 inches; light yellowish brown (10YR 6/4) sandy clay loam, dark yellowish brown (10YR 4/4) moist; moderate medium subangular blocky structure; hard, very friable, slightly sticky and slightly plastic; common very fine and fine roots; many very fine and fine tubular pores; 15 percent durinodes; neutral (pH 7.2); clear irregular boundary.

Bq2—34 to 43 inches; pale brown (10YR 6/3) sandy clay loam, brown (10YR 4/3) moist; weak coarse subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; common very fine and fine tubular pores; 15 percent durinodes; neutral (pH 7.2); gradual wavy boundary.

Bq3—43 to 53 inches; pale brown (10YR 6/3) sandy loam, dark yellowish brown (10YR 4/4) moist; weak coarse subangular blocky structure; slightly hard, very friable; common very fine roots; common very fine and fine tubular pores; 5 percent durinodes; neutral (pH 7.3); gradual wavy boundary.

Cqm—53 to 60 inches; light yellowish brown (10YR 6/4) indurated duripan, dark yellowish brown (10YR 4/4) moist; hard, brittle; neutral (pH 7.3).

Bedrock is at a depth of 10 to 60 inches or more. A duripan is at a depth of 40 to 60 inches. The control section is 0 to 60 percent rock fragments. Clay content

is 15 to 60 percent. From 0 to 50 percent of the surface is covered with rock fragments.

Bear Lake Series

The Bear Lake series consists of very deep, poorly drained soils on flood plains. These soils formed in mixed silty alluvium. Slope is 0 to 2 percent. Elevation is 5,290 to 5,350 feet. Average annual precipitation is 13 to 16 inches, and average annual air temperature is 43 to 45 degrees F.

These soils are fine-silty, frigid Typic Calciaquolls.

Typical pedon of a Bear Lake silt loam in an area of Crooked Creek-Bear Lake complex, 0 to 2 percent slopes, about 459 feet north and 2,800 feet east of the southwest corner of sec. 29, T. 15 S., R. 3 E., Owyhee County, Idaho.

Ak1—0 to 9 inches; gray (10YR 5/1) silt loam, very dark gray (10YR 3/1) moist; weak fine granular structure; slightly hard, friable, slightly sticky and slightly plastic; many very fine, fine, and medium roots; many very fine interstitial pores; strongly effervescent; disseminated lime; moderately alkaline (pH 8.4); clear smooth boundary.

Ak2—9 to 15 inches; gray (10YR 5/1) silt loam, very dark gray (10YR 3/1) moist; moderate very fine granular structure; hard, firm, slightly sticky and slightly plastic; many very fine, fine, and medium roots; common very fine interstitial pores; strongly effervescent; disseminated lime; moderately alkaline (pH 8.1); clear wavy boundary.

Bkg1—15 to 30 inches; light gray (10YR 6/1) silt loam, dark gray (10YR 4/1) moist; weak fine subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine and fine roots; common very fine interstitial pores; strongly effervescent; lime segregated in many fine concretions; moderately alkaline (pH 8.4); clear wavy boundary.

Bkg2—30 to 38 inches; light gray (10YR 6/1) silty clay loam, dark gray (10YR 4/1) moist; massive; hard, friable, slightly sticky and plastic; few very fine and fine roots; common very fine interstitial pores; strongly effervescent; lime segregated in common medium seams and many fine concretions; moderately alkaline (pH 8.4); clear wavy boundary.

Bkg3—38 to 45 inches; light gray (10YR 7/1) silty clay loam, grayish brown (2.5Y 5/2, moist) broken face, gray (10YR 5/1, moist) crushed; common fine prominent reddish yellow (7.5YR 6/6, moist) mottles; massive; hard, firm, sticky and plastic; few very fine roots; few very fine interstitial pores; strongly effervescent; lime segregated in many medium seams and fine concretions; moderately alkaline (pH 8.3); gradual wavy boundary.

Bkg4—45 to 60 inches; light gray (10YR 7/1) silty clay, dark grayish brown (2.5Y 4/2) moist; many fine distinct gray (10YR 5/1, moist) and prominent reddish yellow (7.5YR 6/6, moist) mottles; massive; very hard, firm, very sticky and very plastic; few very fine roots; few very fine interstitial pores; slightly effervescent; lime segregated in few fine soft masses; mildly alkaline (pH 7.7).

The mollic epipedon is 9 to 19 inches thick. The control section is 18 to 35 percent clay. Reaction is mildly alkaline to strongly alkaline. Depth to the base of the calcic horizon is 18 to 40 inches. Distinct or prominent mottles are commonly below a depth of 15 inches.

Bearskin Variant

The Bearskin Variant consists of well drained soils on summits and shoulder slopes. These soils are shallow to granite. They formed in colluvium derived dominantly from granite. Slope is 10 to 40 percent. Elevation is 5,600 to 6,800 feet. Average annual precipitation is 13 to 16 inches, and average annual air temperature is 41 to 45 degrees F.

These soils are loamy, mixed, frigid Lithic Ultic Argixerolls.

Typical pedon of a Bearskin Variant loam in an area of Watchabob-Bearskin Variant complex, 10 to 40 percent slopes, about 2,200 feet north and 1,800 feet east of the southwest corner of sec. 27, T. 46 N., R. 53 E., Elko County, Nevada.

A—0 to 8 inches; grayish brown (10YR 5/2) loam, very dark grayish brown (10YR 3/2) moist; weak medium subangular blocky structure parting to moderate fine granular; soft, friable, slightly sticky and slightly plastic; many very fine and fine roots; many very fine interstitial pores; 10 percent pebbles; slightly acid (pH 6.1); clear smooth boundary.

Bt1—8 to 12 inches; brown (10YR 5/3) gravelly clay loam, very dark grayish brown (10YR 3/2) moist; moderate medium subangular blocky structure; slightly hard, friable, sticky and plastic; common very fine and fine roots; common very fine interstitial pores; few thin clay films on faces of peds and lining pores; 20 percent pebbles; slightly acid (pH 6.4); clear wavy boundary.

Bt2—12 to 16 inches; brown (10YR 5/3) very gravelly sandy clay loam, dark brown (10YR 3/3) moist; moderate fine subangular blocky structure; soft, friable, slightly sticky and plastic; common very fine and fine roots; common very fine interstitial pores; few thin clay films on faces of peds and lining pores; 40 percent pebbles; slightly acid (pH 6.5); clear wavy boundary.

2R—16 inches; fractured granite.

Depth to bedrock and thickness of the solum are less than 20 inches. The control section is 20 to 35 percent pebbles and 20 to 30 percent clay. Base saturation is 50 to 75 percent in all or part of the soil profile. A Cr horizon is present in some pedons.

Bedstead Series

The Bedstead series consists of well drained soils on basalt plateaus. These soils are moderately deep to a duripan. They formed in local alluvium derived from basalt and rhyolite. Slope is 2 to 15 percent. Elevation is 5,220 to 5,350 feet. Average annual precipitation is about 13 inches, and average annual air temperature is about 45 degrees F.

These soils are clayey-skeletal, montmorillonitic, mesic Abruptic Xerollic Durargids.

Typical pedon of a Bedstead extremely stony silt loam in an area of Bedstead-Arbidge association, 2 to 15 percent slopes, about 2,150 feet north and 500 feet east of the southwest corner of sec. 8, T. 15 S., R. 2 W., Owyhee County, Idaho.

A1—0 to 1 inch; pale brown (10YR 6/3) extremely stony silt loam, dark brown (10YR 3/3) moist; strong thick platy structure; slightly hard, very friable, sticky and slightly plastic; common fine and medium roots; many very fine and fine and few medium tubular and vesicular pores; 10 percent pebbles and 10 percent stones; neutral (pH 7.3); abrupt smooth boundary.

A2—1 to 6 inches; brown (10YR 5/3) stony silt loam, dark brown (10YR 4/3) moist; weak medium and coarse subangular blocky structure; slightly hard, very friable, sticky and slightly plastic; common very fine and fine roots and few medium roots; many very fine interstitial and tubular pores; 10 percent cobbles and 10 percent stones; neutral (pH 7.2); clear smooth boundary.

AB—6 to 11 inches; pale brown (10YR 6/3) cobbly silt loam, dark brown (10YR 4/3) moist; weak medium and coarse subangular blocky structure; slightly hard, very friable, sticky and slightly plastic; common very fine and fine roots and few medium roots; common very fine interstitial and vesicular pores; few thin clay films on faces of peds; 20 percent cobbles and 10 percent stones; neutral (pH 7.2); abrupt smooth boundary.

Bt—11 to 18 inches; yellowish brown (10YR 5/4) extremely stony clay, brown (7.5YR 4/4) moist; strong fine and medium angular blocky structure; very hard, firm, sticky and plastic; common fine and few medium roots; continuous thick clay films on faces of peds and in pores; 50 percent stones and 20 percent cobbles; mildly alkaline (pH 7.4); gradual wavy boundary.

Btk—18 to 21 inches; brown (7.5YR 5/4) extremely stony clay loam, brown (7.5YR 4/4) moist; strong fine subangular blocky structure; very hard, firm, sticky and plastic; few fine and medium roots; common moderately thick clay films on faces of peds; 50 percent stones and 20 percent cobbles; slightly effervescent; mildly alkaline (pH 7.5); abrupt wavy boundary.

Bkqm—21 to 22 inches; white (10YR 8/2) indurated duripan; platy; extremely hard, brittle; moderately effervescent; mildly alkaline (pH 7.9); abrupt irregular boundary.

2R—22 inches; basalt.

The duripan is at a depth of 21 to 36 inches. Bedrock is at a depth of 22 to 40 inches. The control section is 35 to 50 percent clay and 35 to 70 percent rock fragments.

Blackfoot Series

The Blackfoot series consists of very deep, somewhat poorly drained soils on flood plains. These soils formed in recent stratified alluvium. Slope is 0 to 2 percent. Elevation is 5,290 to 5,400 feet. Average annual precipitation is 13 to 16 inches, and average annual air temperature is 43 to 45 degrees F.

These soils are fine-loamy, mixed, frigid Fluvaquentic Haploxerolls.

Typical pedon of a Blackfoot silt loam in an area of Blackfoot, frequently flooded-Tucker, gravelly substratum complex, 0 to 2 percent slopes, about 250 feet south and 1,600 feet east of the northwest corner of sec. 25, T. 16 S., R. 2 E., Owyhee County, Idaho.

A1—0 to 7 inches; grayish brown (10YR 5/2) silt loam, black (10YR 2/1) moist; moderate fine granular structure; slightly hard, friable, sticky and plastic; many very fine and fine roots and common medium roots; many very fine and fine interstitial pores; strongly effervescent; disseminated lime; moderately alkaline (pH 8.1); clear smooth boundary.

A2—7 to 13 inches; grayish brown (2.5Y 5/2) loam, very dark grayish brown (2.5Y 3/2) moist; weak medium subangular blocky structure parting to moderate fine granular; slightly hard, friable, slightly sticky and slightly plastic; many very fine and fine roots and common medium roots; many very fine and fine interstitial pores; strongly effervescent; disseminated lime; moderately alkaline (pH 8.0); clear wavy boundary.

Bk—13 to 20 inches; light brownish gray (2.5Y 6/2) loam, dark grayish brown (2.5Y 4/2) moist; moderate medium subangular blocky structure; slightly hard, friable, sticky and slightly plastic; many very fine and fine roots and common medium roots; common very fine and fine interstitial and tubular pores; strongly effervescent; lime segregated in common medium soft masses; moderately alkaline (pH 8.0); clear wavy boundary.

Ab—20 to 27 inches; grayish brown (2.5Y 5/2) loam, very dark grayish brown (2.5Y 3/2) moist; moderate medium subangular blocky structure; slightly hard, friable, sticky and slightly plastic; common very fine, fine, and medium roots; common very fine and fine interstitial and tubular pores; slightly effervescent; disseminated lime; moderately alkaline (pH 7.9); clear wavy boundary.

Bkgb—27 to 34 inches; light gray (2.5Y 7/2) loam, dark grayish brown (2.5Y 4/2) moist; moderate coarse subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine and fine roots; common very fine and fine interstitial and tubular pores; strongly effervescent; lime segregated in few medium soft masses; mildly alkaline (pH 7.9); clear wavy boundary.

2Agb—34 to 45 inches; dark gray (5Y 4/1) silty clay loam, very dark gray (5Y 3/1) moist, dark olive gray (5Y 3/2, moist) crushed; weak medium prismatic structure parting to moderate medium angular blocky; very hard, friable, sticky and plastic; few very fine and fine roots; common very fine and fine tubular pores; neutral (pH 7.2); clear wavy boundary.

2Cg1—45 to 65 inches; pale yellow (5Y 7/3) clay loam, olive (5Y 4/3) and very dark grayish brown (2.5Y 3/2) moist; moderate coarse angular blocky structure; very hard, friable, sticky and plastic; few very fine roots; mildly alkaline (pH 7.5); clear wavy boundary.

3Cg2—65 to 84 inches; variegated extremely gravelly coarse sand; single grain; loose.

The mollic epipedon is 13 to 27 inches thick. The control section is 18 to 27 percent clay. Reaction is moderately alkaline to neutral. One or more buried A horizons are present in most profiles. Sand and pebbles commonly are below a depth of 60 inches.

Blackleg Series

The Blackleg series consists of well drained soils on side slopes of tablelands. These soils are moderately deep to a duripan. They formed in alluvium and colluvium derived from basalt. Slope is 3 to 30 percent. Elevation is 5,400 to 6,300 feet. Average annual precipitation is 13 to 16 inches, and average annual air temperature is 41 to 45 degrees F.

These soils are clayey-skeletal, montmorillonitic, frigid Typic Durixerolls.

Typical pedon of a Blackleg extremely stony silt loam in an area of Yatahoney-Blackleg complex, 4 to 20 percent slopes, about 2,440 feet south and 890 feet east of the northwest corner of sec. 17, T. 47 N., R. 51 E., Elko County, Nevada.

A1—0 to 4 inches; grayish brown (10YR 5/2) extremely stony silt loam, very dark gray (10YR 3/1) moist; moderate fine and medium granular structure; slightly hard, very friable, slightly sticky and plastic; many fine and very fine roots; many very fine tubular pores; few fine dark concretions of manganese oxide; 20 percent cobbles; neutral (pH 6.6); clear wavy boundary.

A2—4 to 8 inches; grayish brown (10YR 5/2) silty clay loam, very dark grayish brown (10YR 3/2) moist; moderate medium subangular blocky structure; slightly hard, friable, sticky and plastic; many very fine and common fine roots; many very fine tubular pores; few fine dark concretions of manganese oxide; 5 percent cobbles; slightly acid (pH 6.5); clear wavy boundary.

Bt1—8 to 15 inches; yellowish brown (10YR 5/4) silty clay loam, dark brown (10YR 3/3) moist; moderate medium subangular blocky structure; hard, friable, sticky and plastic; common fine and very fine roots; many fine and very fine tubular pores; common thin clay films on faces of peds; 25 percent silt grains on faces of peds; few fine dark concretions of manganese oxide; 10 percent cobbles; neutral (pH 6.8); clear wavy boundary.

Bt2—15 to 24 inches; light yellowish brown (10YR 6/4) extremely cobbly clay, dark yellowish brown (10YR 4/4) moist, dark yellowish brown (10YR 3/4, moist) broken face; moderate fine and medium subangular blocky structure; very hard, friable, sticky and very plastic; few fine and very fine roots; common very fine tubular pores; common thin clay films on faces of peds; few fine dark concretions of manganese oxide; 75 percent cobbles; neutral (pH 7.1); clear wavy boundary.

Bt3—24 to 34 inches; yellowish brown (10YR 5/4) cobbly clay, brown (7.5YR 5/4) moist, dark brown (7.5YR 4/4, moist) broken face; strong coarse angular blocky structure; very hard, firm, very sticky and very plastic; few very fine roots; few very fine tubular pores; many moderately thick clay films on faces of peds; few fine dark concretions of manganese oxide; 20 percent cobbles; mildly alkaline (pH 7.4); abrupt wavy boundary.

Bqk—34 to 37 inches; very pale brown (10YR 8/4) very cobbly clay, strong brown (7.5YR 5/8) moist, strong brown (7.5YR 4/6, moist) broken face; massive; slightly hard, friable, sticky and very plastic; few very fine roots; violently effervescent; lime segregated in common large seams; 50 percent cobbles; moderately alkaline (pH 8.0); clear wavy boundary.

Bqkm—37 to 60 inches; very pale brown (10YR 8/4) indurated duripan, strong brown (7.5YR 5/6) moist; strong thick platy structure; 90 percent cobbles and stones; mildly alkaline (pH 7.5).

Bedrock is at a depth of 60 inches or more. As much as 50 percent of the surface is covered with stones. The duripan is at a depth of 30 to 40 inches. The mollic epipedon is 10 to 16 inches thick. The control section is

35 to 60 percent rock fragments and 35 to 55 percent clay.

Bt horizon: Texture is cobbly clay to extremely cobbly clay or is cobbly silty clay loam. Clay content is 27 to 55 percent.

Bluebell Series

The Bluebell series consists of well drained soils on basalt plateaus. These soils are moderately deep to bedrock. They formed in slope alluvium and colluvium derived dominantly from basalt and tuff. Slope is 5 to 20 percent. Elevation is 6,500 to 7,500 feet. Average annual precipitation is 18 to 22 inches, and average annual air temperature is 38 to 41 degrees F.

These soils are loamy-skeletal, mixed Argic Pachic Cryoborolls.

Typical pedon of a Bluebell loam in an area of Strickland-Bluebell complex, 2 to 20 percent slopes, about 2,500 feet south and 2,700 feet west of the northeast corner of sec. 16, T. 47 N., R. 53 E., Elko County, Nevada.

Oi—1 inch to 0; undecomposed leaf litter.

A1—0 to 6 inches; very dark grayish brown (10YR 3/2) loam, black (10YR 2/1) moist; weak fine granular structure; soft, very friable; many very fine and fine roots and common medium and coarse roots; many very fine interstitial pores; 2 percent pebbles; medium acid (pH 5.6); clear wavy boundary.

A2—6 to 17 inches; dark brown (7.5YR 3/2) loam, black (10YR 2/1) moist; weak medium subangular blocky structure and weak fine granular; soft, very friable; many very fine and fine roots and common medium and coarse roots; many very fine interstitial pores; 5 percent pebbles; slightly acid (pH 6.3); clear wavy boundary.

BA—17 to 22 inches; dark brown (10YR 4/3) loam, very dark grayish brown (10YR 3/2) moist; moderate medium subangular blocky structure; soft, friable, slightly sticky and slightly plastic; many very fine and fine roots and common medium and coarse roots; common very fine and fine tubular pores; 5 percent pebbles and 5 percent cobbles; slightly acid (pH 6.1); clear wavy boundary.

Bt—22 to 29 inches; dark brown (10YR 4/3) very stony clay loam, dark brown (7.5YR 3/2) moist; slightly hard, friable, sticky and plastic; common very fine and fine roots and few medium roots; common very fine and fine tubular pores; common thin clay films on faces of peds and lining pores; 10 percent pebbles, 25 percent cobbles, and 20 percent stones; slightly acid (pH 6.3); clear wavy boundary.

2R—29 inches; tuff.

Depth to bedrock and thickness of the solum are 20 to 40 inches. Base saturation is 50 to 70 percent in the entire profile. Reaction is slightly acid or medium acid.

Bt horizon: The horizon is 27 to 35 percent clay and 50 to 70 percent rock fragments.

Bluecreek Series

The Bluecreek series consists of well drained soils on stream terraces. These soils are moderately deep to a duripan. They formed in alluvium derived dominantly from rhyolite and basalt. Slope is 1 to 4 percent. Elevation is 5,290 to 5,330 feet. Average annual precipitation is 13 to 16 inches, and average annual air temperature is 43 to 45 degrees F.

These soils are fine, montmorillonitic, frigid Haplic Durixeralfs.

Typical pedon of a Bluecreek sandy loam in an area of Simonton-Bluecreek complex, 1 to 4 percent slopes, about 1,200 feet north and 1,200 feet east of the southwest corner of sec. 14, T. 15 S., R. 2 E., Owyhee County, Idaho.

E1—0 to 2 inches; pale brown (10YR 6/3) sandy loam, dark brown (10YR 3/3) moist; weak medium subangular blocky structure; soft, very friable; many very fine and fine roots; many fine vesicular pores; 2 percent pebbles; neutral (pH 6.8); clear smooth boundary.

E2—2 to 6 inches; pale brown (10YR 6/3) sandy loam, dark brown (10YR 3/3) moist; moderate medium subangular blocky structure; soft, friable, slightly sticky and slightly plastic; many very fine and fine roots; many very fine and fine tubular pores; 5 percent pebbles; neutral (pH 6.9); clear wavy boundary.

Bt1—6 to 11 inches; pale brown (10YR 6/3) sandy loam, brown (10YR 4/3) moist; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and plastic; many very fine and fine roots; many very fine and fine tubular pores; few thin clay films on faces of peds; 5 percent pebbles; neutral (pH 6.6); clear wavy boundary.

Bt2—11 to 20 inches; light yellowish brown (10YR 6/4) clay loam, dark yellowish brown (10YR 4/4) moist; moderate medium prismatic structure; hard, firm, sticky and plastic; common very fine and fine roots; common very fine tubular and interstitial pores; many moderately thick clay films on faces of peds; 10 percent pebbles; neutral (pH 6.6); clear wavy boundary.

Bt3—20 to 26 inches; pale brown (10YR 6/3) gravelly sandy loam, brown (10YR 4/3) moist; weak medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine and fine roots; common very fine interstitial pores; few thin clay bridges between sand grains; 30 percent pebbles; neutral (pH 7.3); abrupt wavy boundary.

2Bq1—26 to 30 inches; grayish brown (10YR 5/2) gravelly sand, dark brown (10YR 4/3) moist; massive; very hard, very firm; strongly cemented; common very fine and fine roots; common fine interstitial pores; 25 percent pebbles; few thin discontinuous silica laminae; mildly alkaline (pH 7.8); clear wavy boundary.

2Bq2—30 to 41 inches; grayish brown (10YR 5/2) sand, very dark grayish brown (10YR 3/2) moist; massive; hard, firm; weakly cemented; few very fine and fine roots; few very fine interstitial pores; 5 percent pebbles; mildly alkaline (pH 7.5); abrupt wavy boundary.

2Bqkm—41 to 44 inches; grayish brown (10YR 5/2) indurated duripan, dark brown (10YR 4/3) moist; massive; extremely hard, extremely firm; few very fine roots; slightly effervescent; few thin seams of lime; few fine continuous silica laminae; abrupt wavy boundary.

2C—44 to 54 inches; variegated very gravelly sand, dominantly gray (10YR 5/1), dark gray (10YR 4/1) moist; single grain; loose; few very fine roots; many very fine interstitial pores; 40 percent pebbles; mildly alkaline (pH 7.4); abrupt wavy boundary.

2Cqkm—54 to 59 inches; grayish brown (10YR 5/2) indurated duripan, dark grayish brown (10YR 4/2) moist; massive; very hard, very firm; slightly effervescent; few thin seams of lime; continuous thin laminar cap of silica; clear wavy boundary.

C'—59 to 84 inches; variegated very gravelly sand, dominantly gray (10YR 5/1), dark gray (10YR 4/1) moist; single grain; loose; 45 percent pebbles; mildly alkaline (pH 7.8).

The duripan is at a depth of 20 to 40 inches.

Bt2 horizon: Texture is clay loam or clay. Clay content is 35 to 50 percent.

Bq and C horizons: Pebble content is 10 to 45 percent, mostly fine pebbles.

Bluecreek Variant

The Bluecreek Variant consists of very deep, moderately well drained soils on flood plains and in drainageways. These soils formed in mixed alluvium. Slope is 0 to 2 percent. Elevation is 5,300 to 5,320 feet. Average annual precipitation is 13 to 16 inches, and average annual air temperature is 43 to 45 degrees F.

These soils are clayey over sandy or sandy-skeletal, montmorillonitic, frigid Typic Natrixeralfs.

Typical pedon of a Bluecreek Variant silt loam in an area of Bluecreek Variant-Paynecreek Variant complex, 0 to 4 percent slopes, about 1,700 feet north and 1,900 feet west of the southeast corner of sec. 12, T. 15 S., R. 3 E., Owyhee County, Idaho.

E1—0 to 2 inches; light gray (10YR 7/1) silt loam, very dark grayish brown (10YR 3/2) moist; massive; slightly hard, friable; common very fine, fine, and medium roots; many very fine, fine, and medium vesicular pores; neutral (pH 6.9); abrupt smooth boundary.

E2—2 to 7 inches; light gray (10YR 7/1) silt loam, very dark grayish brown (10YR 3/2) moist; strong medium platy structure; many very fine and fine roots; many very fine and fine tubular pores; mildly alkaline (pH 7.4); abrupt smooth boundary.

Btn—7 to 12 inches; gray (10YR 5/1) clay, very dark gray (10YR 3/1, moist) broken face, very dark grayish brown (10YR 3/2, moist) crushed; strong medium prismatic structure parting to moderate medium subangular blocky; very hard, firm, sticky and plastic; many very fine and fine roots and few medium roots; common very fine tubular pores; continuous moderately thick clay films on faces of peds and lining pores; mildly alkaline (pH 7.5); gradual smooth boundary.

Btkn—12 to 21 inches; pale brown (10YR 6/3) clay loam, dark grayish brown (10YR 4/2, moist) broken face, light olive brown (2.5Y 5/4, moist) crushed; moderate medium prismatic structure parting to moderate medium subangular blocky; very hard, firm, sticky and plastic; common very fine and fine roots and few medium roots; many very fine and fine tubular pores; many moderately thick clay films on faces of peds and lining pores; strongly effervescent; lime segregated in common fine seams and few fine soft masses; moderately alkaline (pH 7.9); abrupt smooth boundary.

2C—21 to 90 inches; strata of variegated gravelly sand and extremely gravelly sand; single grain; loose.

Depth to sand and pebbles and thickness of the solum are 20 to 36 inches. The control section is 35 to 50 percent clay in the upper part.

E horizon: Reaction is neutral or mildly alkaline.

Btn horizon: Reaction is mildly alkaline to strongly alkaline.

Btkn horizon: Texture is clay loam or loam. The sodium absorption ratio is 13 to 15. Conductivity of the saturation extract is 4 to 8 millimhos per centimeter. Reaction is mildly alkaline to strongly alkaline.

2C horizon: Pebble content is 20 to 70 percent.

Boulder Lake Series

The Boulder Lake series consists of very deep, somewhat poorly drained soils on the beds of intermittent lakes and on flood plains. These soils formed in clayey alluvium derived from mixed sources. Slope is 0 to 2 percent. Elevation is 5,300 to 6,700 feet. Average annual precipitation is 13 to 16 inches, and average annual air temperature is 41 to 45 degrees F.

These soils are fine, montmorillonitic, frigid Aquic Chromoxererts.

Typical pedon of a Boulder Lake clay in an area of Lasauses Variant-Boulder Lake association, 0 to 1 percent slopes, about 2,050 feet south and 30 feet east of the northwest corner of sec. 12, T. 16 S., R. 1 E., Owyhee County, Idaho.

A1—0 to 1 inch; gray (10YR 5/1) clay, dark gray (10YR 4/1) moist; strong medium and fine granular structure; hard, friable, very sticky and very plastic; few fine and medium roots; many very fine interstitial pores; slightly acid (pH 6.4); abrupt smooth boundary.

A2—1 to 17 inches; gray (10YR 5/1) clay, dark gray (10YR 4/1) moist, very dark grayish brown (10YR 3/2, moist) broken face; strong very coarse prismatic structure parting to strong medium angular blocky; hard, very firm, very sticky and very plastic; common very fine and fine roots; few very fine interstitial pores; neutral (pH 7.1); gradual smooth boundary.

A3—17 to 26 inches; grayish brown (2.5Y 5/2) clay, very dark grayish brown (2.5Y 3/2) moist; weak coarse angular blocky structure; hard, firm, very sticky and very plastic; few very fine and fine roots; few very fine interstitial pores; common slickensides; mildly alkaline (pH 7.8); gradual smooth boundary.

BA—26 to 40 inches; light brownish gray (2.5Y 6/2) clay, dark grayish brown (2.5Y 4/2) moist; weak coarse angular blocky structure; hard, friable, sticky and plastic; few very fine roots; few very fine interstitial pores; common slickensides; moderately alkaline (pH 8.0); clear wavy boundary.

Bk1—40 to 51 inches; light brownish gray (2.5Y 6/2) clay, grayish brown (2.5Y 5/2) moist; weak coarse angular blocky structure; hard, friable, sticky and plastic; few very fine roots; few very fine interstitial pores; common slickensides; slightly effervescent; lime segregated in common fine soft masses; moderately alkaline (pH 8.2); clear wavy boundary.

Bk2—51 to 62 inches; light brownish gray (2.5Y 6/2) clay, light brownish gray (2.5Y 6/2) moist; common fine distinct light yellowish brown (2.5Y 6/4, moist) mottles; weak coarse angular blocky structure; hard, friable, sticky and plastic; few very fine roots; few very fine interstitial pores; slightly effervescent; lime segregated in common fine soft masses; moderately alkaline (pH 7.9); clear smooth boundary.

C—62 to 72 inches; light brownish gray (2.5Y 6/2) clay, light brownish gray (2.5Y 6/2) moist; common fine distinct light yellowish brown (2.5Y 6/4, moist) mottles; massive; hard, friable, sticky and plastic; few very fine interstitial pores; slightly effervescent; disseminated lime; common dark coatings of manganese oxide; mildly alkaline (pH 7.8).

Bedrock is at a depth of 60 inches or more. Depth to secondary lime is 30 to 45 inches. The control section is 60 to 80 percent clay.

In this survey area, the Boulder Lake soils are outside the defined range of the series because the upper 12 inches of the profile has chroma of less than 1.5 when moist and the 10- to 40-inch control section has more than 60 percent clay. These differences, however, do not significantly affect use and management.

Bulake Series

The Bulake series consists of well drained soils on mesas and low hills. The soils are shallow to bedrock. They formed in material derived dominantly from rhyolite and rhyolitic tuff. Slope is 2 to 25 percent. Elevation is 5,280 to 5,700 feet. Average annual precipitation is 13 to 16 inches, and average annual air temperature is 43 to 45 degrees F.

These soils are clayey, montmorillonitic, frigid Lithic Mollic Haploxeralfs.

Typical pedon of a Bulake stony loam in an area of Bulake-Deunah complex, 2 to 25 percent slopes, about 800 feet north and 50 feet west of the southeast corner of sec. 3, T. 46 N., R. 50 E., Elko County, Nevada.

A1—0 to 4 inches; very pale brown (10YR 7/3) stony loam, dark brown (10YR 3/3) moist; weak thick platy structure parting to moderate medium subangular blocky; soft, friable, slightly sticky and slightly plastic; common very fine and fine roots; many very fine and fine vesicular and tubular pores; 5 percent pebbles; neutral (pH 6.9); clear wavy boundary.

A2—4 to 8 inches; pale brown (10YR 6/3) gravelly loam, brown (10YR 4/3) moist; moderate medium subangular blocky structure; soft, friable, sticky and plastic; common very fine and fine roots; common very fine and fine tubular pores; uncoated silt is common on faces of peds; 15 percent pebbles and 5 percent cobbles; neutral (pH 7.1); abrupt wavy boundary.

Bt—8 to 17 inches; strong brown (7.5YR 5/6) clay, brown (7.5YR 4/4) moist, yellowish brown (10YR 5/4, moist) crushed; moderate medium prismatic structure parting to strong medium angular blocky; hard, very firm, very sticky and very plastic; few very fine and fine roots; common fine interstitial pores; few thin clay films on faces of peds; 10 percent pebbles; neutral (pH 6.9); abrupt wavy boundary.

2R—17 inches; rhyolite.

As much as 3 percent of the surface is covered with stones. Bedrock is at a depth of 14 to 20 inches. The control section is 5 to 35 percent rock fragments and 40 to 50 percent clay.

A horizon: Texture is fine sandy loam or stony loam.

Burmah Variant

The Burmah Variant consists of very deep, well drained soils in basins and drainageways on basalt tablelands. These soils formed in alluvium. Slope is 0 to 2 percent. Elevation is 5,500 to 5,800 feet. Average annual precipitation is 13 to 16 inches, and average annual air temperature is 43 to 45 degrees F.

These soils are fine, montmorillonitic, frigid Typic Palexeralfs.

Typical pedon of a Burmah Variant silt loam in an area of Burmah Variant-Torney Variant-Yatahoney complex, 0 to 2 percent slopes, about 500 feet south and 2,700 feet east of the northwest corner of sec. 30, T. 47 N., R. 51 E., Elko County, Nevada.

E1—0 to 3 inches; light gray (10YR 7/2) silt loam, dark grayish brown (10YR 4/2) moist; moderate thick platy structure; slightly hard, friable, slightly sticky and plastic; common fine and medium roots; many very fine tubular pores; few fine dark concretions of manganese oxide; medium acid (pH 6.0); clear smooth boundary.

E2—3 to 12 inches; light gray (10YR 7/2) silt loam, brown (10YR 4/3) moist; moderate medium angular blocky structure; slightly hard, friable, sticky and plastic; common fine and medium roots; many very fine tubular pores; 80 percent uncoated silt on faces of peds; few fine dark concretions of manganese oxide; medium acid (pH 5.7); abrupt wavy boundary.

Bt1—12 to 20 inches; pale brown (10YR 6/3) clay, dark yellowish brown (10YR 4/4) moist, dark yellowish brown (10YR 3/4, moist) broken face; strong medium columnar structure; very hard, firm, very sticky and very plastic; few fine roots; few very fine tubular pores; columns capped with light gray (10YR 7/2) silt; common moderately thick clay films on faces of peds; few fine dark concretions of manganese oxide; neutral (pH 6.8); gradual wavy boundary.

Bt2—20 to 40 inches; pale brown (10YR 6/3) clay, yellowish brown (10YR 5/4) moist; dark yellowish brown (10YR 4/4, moist) broken face; moderate coarse angular blocky structure; very hard, firm, very sticky and very plastic; few fine roots; few very fine tubular pores; common moderately thick clay films on faces of peds; few fine dark concretions of manganese oxide; mildly alkaline (pH 7.5); gradual wavy boundary.

Bt3—40 to 55 inches; light yellowish brown (10YR 6/4) clay loam, dark yellowish brown (10YR 4/4) moist; weak coarse subangular blocky structure; very hard, firm, sticky and plastic; few fine roots; few very fine tubular pores; few thin clay films on faces of peds; few fine dark concretions of manganese oxide; mildly alkaline (pH 7.8); gradual wavy boundary.

C—55 to 60 inches; light yellowish brown (10YR 6/4) clay loam, dark yellowish brown (10YR 4/4) moist; massive; slightly hard, friable, sticky and plastic; few very fine tubular pores; few fine dark concretions of manganese oxide; mildly alkaline (pH 7.8).

Bt1 and Bt2 horizons: Clay content is 45 to 60 percent. Reaction is neutral or mildly alkaline.

Bt3 and C horizons: Texture is loam or clay loam.

Cavanaugh Series

The Cavanaugh series consists of well drained soils on hillsides. These soils are moderately deep to bedrock. They formed in colluvium derived dominantly from rhyolite and rhyolitic tuff. Slope is 15 to 40 percent. Elevation is 5,400 to 7,600 feet. Average annual precipitation is 13 to 16 inches, and average annual air temperature is 41 to 45 degrees F.

These soils are clayey-skeletal, montmorillonitic, frigid Ultic Argixerolls.

Typical pedon of a Cavanaugh very stony loam in an area of Cavanaugh-Obray association, 4 to 30 percent slopes, about 2,000 feet north and 2,400 feet west of the southeast corner of sec. 21, T. 46 N., R. 52 E., Elko County, Nevada.

A1—0 to 5 inches; grayish brown (10YR 5/2) very stony loam, very dark grayish brown (10YR 3/2) moist; weak coarse subangular blocky structure parting to moderate fine subangular blocky; slightly hard, friable, slightly sticky and slightly plastic; many very fine and fine roots; common very fine and fine tubular pores; 10 percent pebbles; slightly acid (pH 6.2); clear wavy boundary.

A2—5 to 12 inches; grayish brown (10YR 5/2) cobbly clay loam, very dark grayish brown (10YR 3/2) moist; moderate medium subangular blocky structure and moderate medium granular; slightly hard, friable, sticky and plastic; common very fine and fine roots; common very fine tubular pores; 10 percent pebbles and 15 percent cobbles; slightly acid (pH 6.3); gradual wavy boundary.

Bt1—12 to 21 inches; brown (10YR 5/3) cobbly clay loam, dark grayish brown (10YR 4/2) moist; strong coarse granular structure; hard, friable, sticky and plastic; common very fine and few fine roots; few very fine tubular pores; common thin and moderately thick clay films on peds; 10 percent pebbles and 15 percent cobbles; slightly acid (pH 6.3); gradual wavy boundary.

Bt2—21 to 32 inches; light yellowish brown (10YR 6/4) very cobbly clay, brown (10YR 4/3) moist, yellowish brown (10YR 5/4, moist) crushed; hard, firm, very sticky and very plastic; few very fine and fine roots; few very fine interstitial pores; common thin clay films on peds; 10 percent pebbles and 50 percent cobbles; neutral (pH 7.0); clear wavy boundary.

2R—32 inches; fractured rhyolitic tuff.

Depth to bedrock and thickness of the solum are 20 to 40 inches. Base saturation is 50 to 75 percent in all or part of the upper 30 inches. The control section is 35 to 50 percent clay and 35 to 65 percent coarse fragments. From 0.1 to 3.0 percent of the surface is covered with stones.

A horizon: Reaction is slightly acid or neutral.

Bt horizon: Texture is very cobbly clay loam, cobbly or very cobbly clay, or very gravelly clay loam. Reaction is slightly acid to mildly alkaline.

Crooked Creek Series

The Crooked Creek series consists of very deep, very poorly drained soils on flood plains. These soils formed in mixed alluvium. Slope is 0 to 2 percent. Elevation is 5,290 to 5,320 feet. Average annual precipitation is 13 to 16 inches, and average annual air temperature is 43 to 45 degrees F.

These soils are fine, montmorillonitic, frigid Cumulic Haplaquolls.

Typical pedon of a Crooked Creek silt loam in an area of Crooked Creek-Bear Lake complex, 0 to 2 percent slopes, about 1,050 feet south and 2,550 feet west of the northeast corner of sec. 17, T. 15 S., R. 3 E., Owyhee County, Idaho.

Oi—1 inch to 0; root mat.

A—0 to 4 inches; dark grayish brown (10YR 4/2) silt loam, very dark gray (10YR 3/1) moist; moderate fine and medium granular structure; soft, friable, slightly sticky and slightly plastic; many very fine and fine roots; many very fine and fine interstitial pores; medium acid (pH 5.7); clear smooth boundary.

2Bw—4 to 25 inches; dark gray (10YR 4/1) clay, black (N 2/0) moist; weak coarse prismatic structure parting to moderate coarse subangular blocky; hard, friable, very sticky and very plastic; common very fine and fine roots; common fine tubular pores; common slickensides and pressure faces; slightly acid (pH 6.4); clear broken boundary.

2Cg1—25 to 33 inches; light gray (10YR 7/1) and light brownish gray (10YR 6/2) silty clay loam, black (N 2/0) and dark grayish brown (10YR 4/2) moist; moderate medium subangular blocky structure; slightly hard, friable, sticky and plastic; few very fine roots; few fine interstitial pores; slightly alkaline (pH 7.6); clear irregular boundary.

2Cg2—33 to 41 inches; dark gray (10YR 4/1) silty clay loam, very dark gray (10YR 3/1) moist; moderate medium angular blocky (sphenoidal) structure; hard, friable, sticky and plastic; few fine interstitial pores; nearly continuous slickensides and pressure faces; mildly alkaline (pH 7.5); clear wavy boundary.

2Cg3—41 to 50 inches; light brownish gray (10YR 6/2) silt loam, very dark gray (10YR 3/1) moist; moderate medium subangular blocky structure; slightly hard, friable, sticky and slightly plastic; strongly effervescent; disseminated lime; moderately alkaline (pH 8.0); gradual wavy boundary.

2Cg4—50 to 84 inches; pale yellow (5Y 8/3) silty clay loam, pale olive (5Y 6/3) moist; few fine prominent brownish yellow (10YR 6/8, moist) mottles; massive; slightly hard, friable, sticky and plastic; slightly effervescent; disseminated lime; moderately alkaline (pH 8.0).

The control section is 35 to 50 percent clay.

A horizon: Reaction is medium acid to neutral.

2Bw horizon: Reaction is slightly acid or neutral.

C horizon: Reaction is mildly alkaline or moderately alkaline.

Deunah Series

The Deunah series consists of well drained soils on summits of basalt and rhyolite tablelands. These soils are moderately deep to a duripan. They formed in old alluvial and eolian material. Slope is 1 to 10 percent. Elevation is 5,400 to 6,000 feet. Average annual precipitation is 13 to 16 inches, and average annual air temperature is 43 to 45 degrees F.

These soils are very fine, montmorillonitic, frigid Abruptic Durixeralfs.

Typical pedon of Deunah stony silt loam, 1 to 4 percent slopes, about 500 feet north and 1,300 feet west of the southeast corner of sec. 15, T. 16 S., R. 1 E., Owyhee County, Idaho.

E—0 to 4 inches; pale brown (10YR 6/3) stony silt loam, dark brown (10YR 4/3) moist; weak medium subangular blocky structure parting to moderate fine granular; soft, friable, slightly sticky and plastic; many very fine and fine roots; many very fine tubular pores; few fine dark concretions of manganese oxide; slightly acid (pH 6.2); clear smooth boundary.

Bt1—4 to 9 inches; pale brown (10YR 6/3) silt loam, dark brown (10YR 4/3) moist; moderate medium subangular blocky structure parting to moderate very fine angular blocky; slightly hard, friable, slightly sticky and plastic; many fine and very fine roots; many very fine tubular pores; 75 percent uncoated silt grains on faces of peds; few fine dark concretions of manganese oxide; slightly acid (pH 6.4); abrupt smooth boundary.

2Bt2—9 to 19 inches; dark yellowish brown (10YR 4/4) clay, light yellowish brown (10YR 6/4) crushed, dark yellowish brown (10YR 4/4) moist; strong medium columnar structure; very hard, very firm, very sticky and very plastic; common fine and very fine roots; few very fine interstitial pores; columns are capped with light gray (10YR 7/2) silt; common thin clay films on faces of peds; 5 percent slickensides; few fine dark concretions of manganese oxide; neutral (pH 6.7); clear wavy boundary.

2Bqk—19 to 23 inches; very pale brown (10YR 7/4) loam, yellowish brown (10YR 5/6) moist; weak thick platy structure; hard, firm, slightly sticky; few very fine roots; common very fine tubular pores; few very fine durinodes; slightly effervescent; lime segregated in few fine filaments and seams; mildly alkaline (pH 7.8); clear wavy boundary.

2Bqkm—23 to 28 inches; yellow (10YR 7/6) indurated duripan, yellowish brown (10YR 5/8) moist; strong medium platy structure; extremely hard, very firm; very few fine tubular pores; continuous opal coatings 1 millimeter to 4 millimeters thick on surfaces of plates; slightly effervescent; lime segregated in common fine seams; 30 percent cobbles; moderately alkaline (pH 8.0); abrupt wavy boundary.

3R—28 inches; fractured basalt.

Bedrock is at a depth of 22 to 40 inches. The duripan is at a depth of 20 to 34 inches. The control section is 0 to 15 percent rock fragments. From 1 to 50 percent of the surface is covered with stones.

E horizon: Reaction is medium acid to neutral.

Bt1 horizon: Texture is silt loam, silty clay loam, or clay loam. Reaction is slightly acid or neutral.

2Bt2 horizon: Clay content is 60 to 70 percent. Reaction is neutral or mildly alkaline.

Disabel Variant

The Disabel Variant consists of very deep, moderately well drained soils on flood plains and in drainageways. These soils formed in loamy alluvium derived from mixed sources. Slope is 0 to 2 percent. Elevation is 5,290 to 5,320 feet. Average annual precipitation is 13 to 16 inches, and average annual air temperature is 43 to 45 degrees F.

These soils are fine, montmorillonitic, frigid Typic Natrixeralfs.

Typical pedon of Disabel Variant silt loam, 0 to 3 percent slopes, about 1,950 feet north and 1,260 feet west of the southeast corner of sec. 22, T. 15 S., R. 2 E., Owyhee County, Idaho.

E1—0 to 4 inches; light gray (10YR 7/2) silt loam, dark brown (10YR 4/3) moist; weak thick platy structure; slightly hard, very friable, slightly plastic; common very fine and fine roots; many fine and medium vesicular pores; neutral (pH 6.7); clear smooth boundary.

E2—4 to 7 inches; light gray (10YR 7/2) silt loam, dark grayish brown (10YR 4/2) moist; massive; hard, friable, slightly plastic; common very fine and fine roots; common fine tubular pores; neutral (pH 6.6); abrupt smooth boundary.

Bt1—7 to 15 inches; pale brown (10YR 6/3) clay, dark brown (10YR 3/3) moist; strong medium columnar structure; hard, firm, very sticky and very plastic; common very fine and fine roots; many fine interstitial pores; common thin clay films on faces of peds; columns capped with uncoated silt; mildly alkaline (pH 7.4); gradual wavy boundary.

Bt2—15 to 23 inches; light brownish gray (2.5Y 6/2) clay, dark brown (10YR 3/3) moist; strong fine angular blocky structure; hard, firm, very sticky and very plastic; few fine roots; many fine interstitial pores; common thin clay films on faces of peds; mildly alkaline (pH 7.5); clear wavy boundary.

Btk—23 to 33 inches; light gray (2.5Y 7/2) clay loam, olive brown (2.5Y 4/3) moist; weak medium subangular blocky structure; hard, friable, sticky and plastic; few fine roots; few fine tubular pores; few thin clay films on faces of peds; violently effervescent; lime segregated in common fine soft masses; mildly alkaline (pH 7.7); clear wavy boundary.

By—33 to 42 inches; light gray (2.5Y 7/2) clay loam, olive brown (2.5Y 4/3) moist; massive; slightly hard, friable, slightly sticky and plastic; few fine roots; few fine tubular pores; slightly effervescent; common fine and medium soft masses of gypsum; mildly alkaline (pH 7.7); gradual smooth boundary.

C1—42 to 67 inches; light gray (2.5Y 7/2) loam, olive brown (2.5Y 4/3) moist; massive; slightly hard, very friable, slightly plastic; few fine tubular pores; slightly effervescent; disseminated lime; mildly alkaline (pH 7.7); clear wavy boundary.

C2—67 to 84 inches; white (5Y 8/2) loam, olive (5Y 5/3) moist; massive; slightly hard, very friable, slightly plastic; few fine tubular pores; slightly effervescent; disseminated lime; mildly alkaline (pH 7.7).

Bt1 and Bt2 horizons: Clay content is 40 to 50 percent. The sodium absorption ratio is 13 to 20 in the lower part of the Bt2 horizon.

By and C horizons: Texture is fine sandy loam, clay loam, or loam.

Dranyon Series

The Dranyon series consists of deep, well drained soils on concave hillsides and mountainsides. These soils formed in colluvium derived dominantly from rhyolite and rhyolitic tuff or basalt. Slope is 4 to 50 percent. Elevation is 6,200 to 7,800 feet. Average annual precipitation is 20 to 22 inches, and average annual air temperature is 35 to 41 degrees F.

These soils are fine-loamy, mixed Argic Pachic Cryoborolls.

Typical pedon of a Dranyon loam in an area of Parkay-Dranyon-Cavanaugh complex, 15 to 50 percent slopes, about 100 feet north and 1,100 feet west of the southeast corner of sec. 35, T. 46 N., R. 52 E., Elko County, Nevada.

Oi—1 inch to 0; litter layer.

A1—0 to 6 inches; dark grayish brown (10YR 4/2) loam, very dark brown (10YR 2/2) moist; weak fine granular structure; soft, very friable, slightly plastic; many very fine and fine roots and common medium roots; slightly acid (pH 6.2); clear wavy boundary.
A2—6 to 13 inches; brown (10YR 5/3) loam, very dark grayish brown (10YR 3/2) moist; weak coarse subangular blocky structure parting to moderate medium subangular blocky; slightly hard, friable, slightly sticky and plastic; many very fine and fine roots and common medium roots; medium acid (pH 5.9); gradual wavy boundary.
Bt1—13 to 22 inches; dark grayish brown (10YR 4/2) loam, very dark grayish brown (10YR 3/2) moist; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine and fine roots and few medium roots; few thin clay films on faces of peds and lining pores; slightly acid (pH 6.1); gradual wavy boundary.
Bt2—22 to 30 inches; brown (10YR 5/3) loam, dark grayish brown (10YR 4/2) moist; weak medium subangular blocky structure; hard, friable, slightly sticky and plastic; common very fine and fine roots and few medium roots; common thin clay films on faces of peds; medium acid (pH 6.0); gradual wavy boundary.
Bt3—30 to 36 inches; brown (10YR 5/3) loam, dark grayish brown (10YR 4/2) moist; moderate medium subangular blocky structure; hard, friable, sticky and plastic; few very fine and fine roots; common thin clay films on faces of peds; 5 percent cobbles and 5 percent pebbles; slightly acid (pH 6.1); gradual wavy boundary.
Bt4—36 to 53 inches; yellowish brown (10YR 5/4) very cobbly clay loam, dark yellowish brown (10YR 3/4) moist; moderate medium subangular blocky structure; slightly hard, friable, sticky and plastic; few very fine and fine roots; common thin clay films on faces of peds; 40 percent cobbles and 10 percent pebbles; slightly acid (pH 6.1); clear wavy boundary.
2R—53 inches; fractured rhyolitic tuff.

Bedrock is at a depth of 40 to 60 inches or more. The control section is 20 to 35 percent clay and 20 to 35 percent coarse fragments.

A horizon: Reaction is slightly acid or medium acid.

Bt horizon: Texture is loam and very cobbly clay loam. Reaction is slightly acid or medium acid.

Durixeralfs

Durixeralfs consist of well drained soils on escarpments and on side slopes of tablelands. These soils are shallow or moderately deep to a duripan. They formed in colluvium derived dominantly from basalt. Slope is 20 to 30 percent. Elevation is 5,300 to 6,400 feet. Average annual precipitation is 13 to 16 inches, and average annual air temperature is 42 to 45 degrees F.

Reference pedon of Durixeralfs in an area of Haploxeralfs-Durixeralfs-Rubble land complex, 20 to 50 percent slopes, about 1,850 feet north and 1,100 feet east of the southwest corner of sec. 22, T. 15 S., R. 2 E., Owyhee County, Idaho.

A1—0 to 5 inches; light brownish gray (10YR 6/2) extremely stony loam, very dark grayish brown (10YR 3/2) moist; weak fine granular structure; soft, very friable; many very fine and fine roots; many very fine and fine interstitial pores; 20 percent cobbles and 30 percent stones; neutral (pH 6.8); clear smooth boundary.
A2—5 to 12 inches; light grayish brown (10YR 6/2) loam, very dark grayish brown (10YR 3/2) moist; weak medium subangular blocky structure; soft, very friable, slightly sticky; many very fine and fine roots; common very fine and fine tubular pores; 5 percent cobbles; neutral (pH 6.9); clear wavy boundary.
Bt1—12 to 20 inches; pale brown (10YR 6/3) clay loam, dark brown (10YR 3/3) moist; strong medium subangular blocky structure; slightly hard, friable, sticky and plastic; common very fine and fine roots; common very fine and fine tubular pores; common thin clay films on faces of peds and lining pores; 10 percent cobbles; neutral (pH 7.0); clear wavy boundary.
Bt2—20 to 25 inches; brown (10YR 5/3) clay, dark brown (10YR 4/3) moist; weak medium prismatic structure parting to strong medium subangular blocky; very hard, firm, very sticky and very plastic; common very fine roots; few fine interstitial pores; common moderately thick clay films on faces of peds and lining pores; many pressure faces; 5 percent cobbles; neutral (pH 7.2); clear smooth boundary.
Btk—25 to 29 inches; yellow (10YR 7/6) loam, dark yellowish brown (10YR 4/4) moist; moderate fine subangular blocky structure; slightly hard, friable, sticky and plastic; common very fine roots; common fine interstitial pores; few thin clay films on faces of peds; strongly effervescent; disseminated lime and lime segregated in common fine seams; 10 percent pebbles; moderately alkaline (pH 8.4); abrupt wavy boundary.
Bqkm—29 to 33 inches; variegated but dominantly very pale brown (10YR 8/4) duripan, dominantly dark yellowish brown (10YR 4/4) moist; strong medium platy structure; very firm; few fine tubular pores; slightly effervescent; lime segregated in few fine seams; silica caps 1 millimeter thick on tops of plates; abrupt wavy boundary.
2R—33 inches; basalt.

The surface is stony to rubbly. The duripan is at a depth of 10 to 40 inches. The B horizon is loam to clay and is 5 to 80 percent rock fragments. Because these soils are so variable, it was not practical to map them below the great group level.

Earcree Series

The Earcree series consists of very deep, well drained soils on hillsides and mountainsides. These soils formed in colluvium derived dominantly from granite. Slope is 20 to 45 percent. Elevation is 5,600 to 6,900 feet. Average annual precipitation is 16 to 18 inches, and average annual air temperature is 39 to 41 degrees F.

These soils are coarse-loamy, mixed Pachic Cryoborolls.

Typical pedon of an Earcree gravelly coarse sandy loam in an area of Moonstone-Earcree association, 20 to 45 percent slopes, about 500 feet north and 600 feet west of the southeast corner of sec. 28, T. 47 N., R. 53 E., Elko County, Nevada.

A1—0 to 6 inches; brown (10YR 5/3) gravelly coarse sandy loam, very dark brown (10YR 2/2) moist; weak coarse granular structure; soft, very friable; many very fine and coarse roots; many fine interstitial pores; 20 percent pebbles; slightly acid (pH 6.4); clear smooth boundary.

A2—6 to 22 inches; dark grayish brown (10YR 4/2) coarse sandy loam, very dark brown (10YR 2/2) moist; weak coarse subangular blocky structure; soft, very friable; common very fine and medium roots; many very fine and fine interstitial pores; 10 percent pebbles; slightly acid (pH 6.3); gradual smooth boundary.

A3—22 to 41 inches; grayish brown (10YR 5/2) coarse sandy loam, very dark brown (10YR 2/2) moist; weak coarse and very coarse subangular blocky structure; slightly hard, very friable; common very fine and medium roots; many very fine and fine interstitial pores; 10 percent pebbles; medium acid (pH 6.1); gradual smooth boundary.

C—41 to 64 inches; brown (10YR 5/3) gravelly loamy coarse sand, dark brown (10YR 3/3) moist; single grain; loose; 20 percent pebbles; slightly acid (pH 6.2).

The mollic epipedon is 22 to 49 inches thick. Bedrock is at a depth of 60 inches or more. The control section is 5 to 15 percent clay and 5 to 30 percent rock fragments. Reaction is medium acid to neutral. A Bw horizon is present in some pedons.

C horizon: Texture is gravelly or very gravelly loamy coarse sand to coarse sandy loam.

Haploxeralfs

Haploxeralfs consist of shallow to very deep, well drained soils on escarpments and on side slopes of tablelands. These soils formed in colluvium derived dominantly from basalt. Slope is 20 to 50 percent. Elevation is 5,300 to 6,400 feet. Average annual precipitation is 13 to 16 inches, and average annual air temperature is 42 to 45 degrees F.

Reference pedon of Haploxeralfs in an area of Haploxeralfs-Durixeralfs-Rubble land complex, 20 to 50 percent slopes, about 650 feet north and 100 feet east of the southwest corner of sec. 7, T. 16 S., R. 2 E., Owyhee County, Idaho.

A—0 to 2 inches; pale brown (10YR 6/3) extremely stony loam, very dark grayish brown (10YR 3/2) moist; weak fine granular structure; soft, very friable, slightly sticky and slightly plastic; many very fine and fine roots; many very fine and fine interstitial pores; 10 percent cobbles and 20 percent stones; slightly acid (pH 6.4); clear smooth boundary.

BA—2 to 6 inches; brown (10YR 5/3) clay loam, very dark grayish brown (10YR 3/2, moist) broken face, dark brown (10YR 4/3, moist) crushed; moderate fine granular structure; slightly hard, friable, sticky and plastic; many very fine and fine roots; many very fine and fine interstitial pores; 10 percent pebbles; neutral (pH 7.0); clear wavy boundary.

Bt—6 to 17 inches; brown (7.5YR 4/2) cobbly clay, dark brown (10YR 4/3) moist; strong coarse subangular blocky structure; very hard, firm, sticky and very plastic; common very fine and fine roots; few fine tubular pores; common moderately thick clay films on faces of peds and lining pores; many pressure faces; 10 percent pebbles and 15 percent cobbles; neutral (pH 7.0); abrupt irregular boundary.

2R—17 inches; basalt.

The surface is stony to rubbly. Bedrock is at a depth of 10 inches to more than 60 inches. The B horizon is loam to clay and is 5 to 80 percent rock fragments. Because these soils are so variable, it was not practical to map them below the great group level.

Hatpeak Series

The Hatpeak series consists well drained soils on basalt tablelands. These soils are moderately deep to a duripan. They formed in old alluvium derived from mixed sources with some loess influence. Slope is 1 to 4 percent. Elevation is 5,500 to 5,650 feet. Average annual precipitation is 13 to 15 inches, and average annual air temperature is 43 to 45 degrees F.

These soils are fine, montmorillonitic, frigid Typic Durixerolls.

Typical pedon of a Hatpeak silt loam in an area of Petan-Deunah-Hatpeak complex, 1 to 8 percent slopes, about 2,200 feet south and 500 feet west of the northeast corner of sec. 18, T. 16 S., R. 1 E., Owyhee County, Idaho.

A—0 to 11 inches; brown (10YR 5/3) silt loam, dark brown (10YR 3/3) moist; weak medium subangular blocky structure parting to moderate medium granular; soft, friable, slightly sticky and plastic; many fine and very fine roots; many very fine tubular pores; few fine dark concretions of manganese oxide; neutral (pH 6.7); clear wavy boundary.

BA—11 to 16 inches; light yellowish brown (10YR 6/4) silt loam, dark yellowish brown (10YR 3/4) moist; strong medium subangular blocky structure; slightly hard, friable, sticky and plastic; common fine roots; many very fine tubular pores; few fine dark concretions of manganese oxide; slightly acid (pH 6.5); gradual smooth boundary.

Bt1—16 to 24 inches; light yellowish brown (10YR 6/4) silty clay loam, dark yellowish brown (10YR 4/4) moist; strong fine angular blocky structure; hard, friable, very sticky and very plastic; common fine roots; many very fine tubular pores; few thin clay films on faces of peds; common uncoated silt grains on faces of peds; slightly acid (pH 6.5); abrupt wavy boundary.

Bt2—24 to 34 inches; light yellowish brown (10YR 6/4) clay, dark yellowish brown (10YR 4/4) moist; strong medium prismatic structure; hard, firm, very sticky and very plastic; common very fine roots; few very fine tubular pores; many thin clay films on faces of peds; neutral (pH 7.3); abrupt wavy boundary.

Bqkm—34 to 41 inches; very pale brown (10YR 8/4) indurated duripan, brownish yellow (10YR 6/6) moist; strong medium platy structure; very hard, very firm; violently effervescent; lime segregated in horizontal seams along surfaces of plates.

2R—41 inches; basalt.

The duripan is at a depth of 20 to 34 inches. Bedrock is at a depth of 40 to 50 inches.

Bt2 horizon: Clay content is 40 to 50 percent.

Hayspur Series

The Hayspur series consists of very deep, poorly drained soils on flood plains and in drainageways. These soils formed in recent stratified alluvium derived from mixed sources. Slope is 0 to 2 percent. Elevation is 5,260 to 5,600 feet. Average annual precipitation is 13 to 16 inches, and average annual air temperature is 43 to 45 degrees F.

These soils are fine-loamy, mixed, frigid Fluvaquentic Haplaquolls.

Typical pedon of Hayspur clay loam, 0 to 2 percent slopes, about 1,900 feet south and 500 feet east of the northwest corner of sec. 18, T. 47 N., R. 52 E., Elko County, Nevada.

Ak—0 to 4 inches; grayish brown (10YR 5/2) clay loam, black (10YR 2/1) moist; moderate coarse granular structure; hard, very friable, slightly sticky and plastic; many very fine and fine roots; many very fine and fine tubular and interstitial pores; slightly effervescent; disseminated lime; 10 percent pebbles; moderately alkaline (pH 8.3); clear smooth boundary.

A—4 to 13 inches; grayish brown (10YR 5/2) clay loam, very dark gray (10YR 3/1) moist; common fine distinct brown (7.5YR 4/4, moist) mottles; moderate medium and coarse subangular blocky structure; very hard, friable, sticky and plastic; common very fine and fine roots; many very fine interstitial pores; 10 percent pebbles; common organic stains; common uncoated silt grains on faces of peds; mildly alkaline (pH 7.4); gradual smooth boundary.

AC—13 to 21 inches; light brownish gray (10YR 6/2) clay loam, dark grayish brown (10YR 4/2) moist; weak coarse subangular blocky structure parting to moderate very fine subangular blocky; very hard, friable, sticky and plastic; common very fine roots; many very fine interstitial pores; 10 percent pebbles; neutral (pH 7.2); clear smooth boundary.

Ab—21 to 30 inches; gray (10YR 5/1) loam, very dark gray (10YR 3/1) moist; common fine faint dark grayish brown (10YR 4/2, moist) mottles; weak coarse subangular blocky structure parting to moderate very fine subangular blocky; very hard, friable, sticky and plastic; common very fine roots; many very fine interstitial pores; 10 percent pebbles; mildly alkaline (pH 7.7); gradual wavy boundary.

Bkg—30 to 40 inches; light gray (2.5Y 7/2) silt loam, dark gray (5Y 4/1) moist; massive; very hard, friable, sticky and plastic; few very fine roots; common fine interstitial pores; strongly effervescent; lime segregated in common fine filaments and soft masses; moderately alkaline (pH 8.0); gradual wavy boundary.

Cg1—40 to 46 inches; light gray (2.5Y 7/2) silt loam, olive gray (5Y 4/2) moist; many large faint dark gray (5Y 4/1, moist) and olive (5Y 4/3, moist) mottles; massive; very hard, friable, slightly sticky and plastic; few very fine roots; common fine dark-colored concretions of manganese oxide; moderately alkaline (pH 7.9); gradual wavy boundary.

Cg2—46 to 59 inches; light gray (5Y 7/2) silt loam, olive (5Y 5/3) moist; common medium faint greenish gray (5GY 5/1, moist) mottles; massive; very hard, friable, slightly sticky and slightly plastic; common fine dark-colored concretions of manganese oxide; mildly alkaline (pH 7.8); clear wavy boundary.

2C—59 to 84 inches; variegated very gravelly loamy sand; single grain; loose.

Depth to sand and pebbles is 40 to 70 inches.

Ak and A horizons: Reaction is moderately alkaline or strongly alkaline. The sodium absorption ratio is 2 to 16.

AC, Bk, and C horizons: Texture is loam, clay loam, or silt loam.

Lasauses Variant

The Lasauses Variant consists of very deep, poorly drained soils on intermittent lakebeds. These soils formed in lacustrine sediment from the surrounding basalt plateau. Slope is 0 to 1 percent. Elevation is about 5,670 feet. Average annual precipitation is 13 to 16 inches, and average annual air temperature is 43 to 45 degrees F.

These soils are very fine, montmorillonitic, nonacid, frigid Aeric Halaquepts.

Typical pedon of a Lasauses Variant clay in an area of Lasauses Variant-Boulder Lake association, 0 to 1 percent slopes, about 50 feet north and 60 feet west of the southeast corner of sec. 14, T. 16 S., R. 1 E., Owyhee County, Idaho.

E—0 to 1 inch; white (2.5Y 8/2) silt loam, light brownish gray (2.5Y 6/2) moist; moderate very thin platy structure; slightly hard, friable, slightly sticky and plastic; common fine roots; few very fine tubular pores; mildly alkaline (pH 7.8); abrupt smooth boundary.

Btg—1 to 7 inches; grayish brown (2.5Y 5/2) clay, dark grayish brown (2.5Y 4/2) moist; common fine prominent yellowish brown (10YR 5/6) mottles; strong very fine and fine angular blocky structure; hard, friable, sticky and plastic; common fine roots; few very fine tubular pores; few thin clay films on faces of peds and in pores; mildly alkaline (pH 7.8); clear smooth boundary.

Bg1—7 to 15 inches; pale olive (5Y 6/3) clay, dark grayish brown (2.5Y 4/2) moist; strong medium angular blocky structure; hard, friable, sticky and plastic; common fine roots; few very fine tubular pores; strongly alkaline (pH 8.5); gradual wavy boundary.

Bg2—15 to 22 inches; pale olive (5Y 6/3) clay, dark grayish brown (2.5Y 4/2) moist; moderate medium subangular blocky structure; hard, friable, sticky and plastic; few fine roots; few very fine tubular pores; moderately alkaline (pH 8.3); clear wavy boundary.

Bkg—22 to 58 inches; light olive gray (5Y 6/2) clay, olive gray (5Y 5/2) moist; moderate fine and medium angular blocky structure; hard, friable, sticky and plastic; violently effervescent; lime segregated in common medium and large soft masses; moderately alkaline (pH 8.1); clear smooth boundary.

C—58 to 66 inches; pale yellow (5Y 7/3) silty clay, light brownish gray (2.5Y 6/2) moist; massive; hard, friable, sticky and plastic; slightly effervescent; disseminated lime; moderately alkaline (pH 8.1).

B and C horizons: Clay content is 60 to 75 percent. Reaction is mildly alkaline to strongly alkaline. The sodium absorption ratio is 12 to 20 in the upper part of the B horizon.

Moonstone Series

The Moonstone series consists of well drained soils on hillsides and mountainsides. These soils are moderately deep to weathered bedrock. They formed in colluvium and residuum derived dominantly from granite. Slope is 20 to 45 percent. Elevation is 5,600 to 6,900 feet. Average annual precipitation is 14 to 16 inches, and average annual air temperature is 41 to 43 degrees F.

These soils are coarse-loamy, mixed, frigid Pachic Ultic Haploxerolls.

Typical pedon of a Moonstone gravelly coarse sandy loam in an area of Moonstone-Earcree association, 20 to 45 percent slopes, about 500 feet south and 1,600 feet east of the northwest corner of sec. 4, T. 46 N., R. 53 E., Elko County, Nevada.

A1—0 to 8 inches; dark grayish brown (10YR 4/2) gravelly coarse sandy loam, very dark grayish brown (10YR 3/2) moist; weak coarse granular structure; soft, very friable; common very fine and fine roots; many fine interstitial pores; 20 percent pebbles; slightly acid (pH 6.5); clear smooth boundary.

A2—8 to 22 inches; dark grayish brown (10YR 4/2) gravelly coarse sandy loam, very dark grayish brown (10YR 3/2) moist; weak medium subangular blocky structure; slightly hard, friable; common very fine and fine roots; many very fine and fine interstitial pores; 20 percent pebbles; slightly acid (pH 6.5); gradual smooth boundary.

Bt—22 to 28 inches; brown (10YR 5/3) gravelly coarse sandy loam, dark brown (10YR 4/3) moist; weak coarse subangular blocky structure; hard, friable, slightly sticky and slightly plastic; common fine roots; many very fine and fine interstitial pores and few medium tubular pores; few thin clay films on faces of peds and lining pores; 15 percent pebbles and 5 percent cobbles; slightly acid (pH 6.3); gradual irregular boundary.

2Cr—28 inches; weathered granite.

Bedrock is at a depth of 24 to 40 inches. Base saturation is 50 to 75 percent in the upper 30 inches. The mollic epipedon is 22 to 32 inches thick. The control section is 10 to 15 percent clay. The solum is 24 to 35 inches thick. Reaction is slightly acid or neutral.

Bt horizon: Texture is gravelly coarse sandy loam or coarse sandy loam. Rock fragment content is 5 to 35 percent.

Obray Series

The Obray series consists of very deep, well drained soils on concave hillsides. These soils formed in slope alluvium derived dominantly from rhyolite and rhyolitic tuff. Slope is 4 to 20 percent. Elevation is 5,400 to 6,300 feet. Average annual precipitation is 15 to 17 inches, and average annual air temperature is 43 to 45 degrees F.

These soils are fine, montmorillonitic, frigid Typic Chromoxererts.

Typical pedon of an Obray stony clay in an area of Cavanaugh-Obray association, 4 to 30 percent slopes, about 1,800 feet north and 1,700 feet east of the southwest corner of sec. 29, T. 46 N., R. 52 E., Elko County, Nevada.

A1—0 to 4 inches; dark grayish brown (10YR 4/2) stony clay, very dark brown (10YR 2/2) moist; weak fine subangular blocky structure parting to strong medium granular; very hard, very firm, very sticky and very plastic; many very fine and fine roots and few medium roots; 5 percent stones, 2 percent cobbles, and 15 percent pebbles; slightly acid (pH 6.4); clear smooth boundary.

A2—4 to 22 inches; dark grayish brown (10YR 4/2) clay, very dark grayish brown (10YR 3/2) moist; moderate coarse prismatic structure parting to strong medium and fine subangular blocky; very hard, very firm, very sticky and very plastic; common very fine roots and few fine and medium roots; common slickensides; 3 percent cobbles and 10 percent pebbles; slightly acid (pH 6.5); gradual wavy boundary.

A3—22 to 26 inches; dark grayish brown (10YR 4/2) clay, very dark grayish brown (10YR 3/2) moist; moderate coarse prismatic structure parting to moderate coarse subangular blocky; very hard, very firm, very sticky and very plastic; few very fine and fine roots; many slickensides; 2 percent cobbles and 10 percent pebbles; slightly acid (pH 6.5); gradual wavy boundary.

A4—26 to 35 inches; brown (10YR 5/3) clay, dark brown (10YR 3/3) and very dark grayish brown (10YR 3/2) moist; weak coarse subangular blocky structure parting to weak medium subangular blocky; very hard, very firm, very sticky and very plastic; few very fine and fine roots; many slickensides; 5 percent pebbles; slightly acid (pH 6.5); gradual wavy boundary.

Bw—35 to 44 inches; pale brown (10YR 6/3) clay loam, dark brown (10YR 4/3) moist; weak medium subangular blocky structure; very hard, very firm, very sticky and very plastic; few very fine and fine roots; common slickensides; 2 percent pebbles; mildly alkaline (pH 7.7); gradual wavy boundary.

Bk1—44 to 52 inches; light yellowish brown (10YR 6/4) clay loam, dark yellowish brown (10YR 3/4) moist; massive; very hard, firm, sticky and plastic; few very fine roots; slightly effervescent; 3 percent cobbles and 10 percent pebbles; moderately alkaline (pH 8.2); clear wavy boundary.

Bk2—52 to 61 inches; very pale brown (10YR 7/4) clay loam, brown (10YR 5/3) moist; massive; hard, firm, sticky and plastic; slightly effervescent; 10 percent pebbles; moderately alkaline (pH 8.2).

Bedrock is at a depth of 60 inches or more.

A horizon: Reaction is slightly acid or neutral. Clay content is 40 to 60 percent.

Bw horizon: Clay content is 30 to 40 percent. Reaction is slightly acid or neutral.

Bk horizon: Coarse fragment content is 5 to 15 percent. Reaction is slightly acid to moderately alkaline.

Parkay Series

The Parkay series consists of deep, well drained soils on hillsides and mountainsides. These soils formed in colluvium derived dominantly from rhyolite, basalt, and rhyolitic tuff. Slope is 5 to 50 percent. Elevation is 5,800 to 7,800 feet. Average annual precipitation is 16 to 22 inches, and average annual air temperature is 35 to 41 degrees F.

These soils are loamy-skeletal, mixed Argic Pachic Cryoborolls.

Typical pedon of a Parkay stony loam in an area of Parkay-Dranyon-Cavanaugh complex, 15 to 50 percent slopes, about 800 feet south and 1,100 feet west of the northeast corner of sec. 36, T. 46 N., R. 52 E., Elko County, Nevada.

Oi—2 inches to 0; litter layer.

A1—0 to 3 inches; dark grayish brown (10YR 4/2) stony loam, very dark grayish brown (10YR 3/2) moist; weak fine granular structure; soft, very friable, slightly sticky; many very fine and fine roots and few medium roots; 5 percent cobbles and 5 percent pebbles; slightly acid (pH 6.4); clear smooth boundary.

A2—3 to 10 inches; dark grayish brown (10YR 4/2) loam, very dark grayish brown (10YR 3/2) moist; weak medium subangular blocky structure; soft, very friable, slightly sticky; many very fine and fine roots and few medium roots; 10 percent cobbles and 3 percent pebbles; slightly acid (pH 6.5); clear wavy boundary.

A3—10 to 19 inches; dark grayish brown (10YR 4/2) very cobbly loam, very dark grayish brown (10YR 3/2) moist; weak coarse subangular blocky structure parting to moderate fine subangular blocky; soft, friable, slightly sticky and slightly plastic; many very fine and fine roots; 30 percent cobbles and 15 percent pebbles; slightly acid (pH 6.5); gradual wavy boundary.

Bt1—19 to 30 inches; brown (10YR 5/3) extremely cobbly clay loam, dark brown (10YR 3/3) moist;

moderate fine and medium subangular blocky structure; slightly hard, friable, sticky and slightly plastic; common very fine and fine roots; few thin clay films on faces of peds; 50 percent cobbles and 20 percent pebbles; slightly acid (pH 6.2); gradual wavy boundary.

Bt2—30 to 45 inches; light yellowish brown (10YR 6/4) extremely cobbly clay loam, dark brown (10YR 4/3) moist; moderate fine subangular blocky structure; slightly hard, friable, sticky and plastic; few very fine and fine roots; very few thin clay films on faces of peds; 75 percent cobbles and 10 percent pebbles; slightly acid (pH 6.1); clear wavy boundary.

2R—45 inches; fractured rhyolitic tuff.

Bedrock is at a depth of 40 to 60 inches or more. The control section is 25 to 35 percent clay and 50 to 75 percent coarse fragments. From 0.01 to 3.0 percent of the surface is covered with cobbles and stones.

A horizon: Reaction is neutral or slightly acid.

Bt horizon: Texture is very cobbly clay loam and extremely cobbly clay loam. Reaction is neutral or slightly acid.

In this survey area, the Parkay soils are outside the defined range of the series because they are slightly acid. This difference, however, does not significantly affect use and management.

Paynecreek Series

The Paynecreek series consists of very deep, well drained soils on dissected stream terraces. These soils formed in gravelly alluvium derived from mixed sources. Slope is 0 to 16 percent. Elevation is 5,270 to 5,600 feet. Average annual precipitation is 13 to 16 inches, and average annual air temperature is 43 to 45 degrees F.

These soils are fine-loamy, mixed, frigid Typic Argixerolls.

Typical pedon of a Paynecreek gravelly loam in an area of Paynecreek-Thacker, dry complex, 4 to 10 percent slopes, about 1,005 feet south and 1,040 feet west of the northeast corner of sec. 10, T. 47 N., R. 51 E., Elko County, Nevada.

A—0 to 11 inches; brown (10YR 5/3) gravelly loam, very dark grayish brown (10YR 3/2) moist; moderate medium and fine granular structure; soft, friable; many very fine and fine roots; many very fine and fine tubular and interstitial pores; 20 percent pebbles; neutral (pH 6.6); clear smooth boundary.

Bt1—11 to 17 inches; yellowish brown (10YR 5/4) gravelly loam, dark brown (10YR 3/3) moist; weak medium subangular blocky structure; soft, friable, slightly sticky and slightly plastic; many very fine and fine roots; many very fine and fine tubular pores; few thin clay films on faces of peds; 20 percent pebbles; neutral (pH 6.9); clear wavy boundary.

Bt2—17 to 38 inches; light yellowish brown (10YR 6/4) gravelly clay loam, dark yellowish brown (10YR 4/4) moist; moderate medium subangular blocky structure; slightly hard, friable, sticky and plastic; common very fine and fine roots; many very fine and fine tubular pores; common thin clay films on faces of peds; 20 percent pebbles; neutral (pH 7.1); gradual wavy boundary.

BC—38 to 50 inches; light yellowish brown (10YR 6/4) gravelly sandy loam, dark yellowish brown (10YR 4/4) moist; weak medium subangular blocky structure; soft, friable, slightly sticky and plastic; few very fine and fine roots; common very fine tubular pores; 20 percent pebbles; neutral (pH 7.2); clear wavy boundary.

2C—50 to 84 inches; variegated very gravelly loamy coarse sand, dominantly very pale brown (10YR 7/4), yellowish brown (10YR 5/4) moist; single grain; loose; many medium and fine interstitial pores; 40 percent pebbles; neutral (pH 7.2).

The control section is 15 to 30 percent pebbles. Depth to sand and pebbles and thickness of the solum are 40 to 55 inches. The mollic epipedon is 10 to 17 inches thick.

Bt2 horizon: Texture is gravelly sandy clay loam or gravelly clay loam. Clay content is 24 to 34 percent.

2C horizon: Pebble content is 35 to 60 percent.

Paynecreek Variant

The Paynecreek Variant consists of very deep, well drained soils on low terrace remnants. These soils formed in mixed alluvium. Slope is 0 to 4 percent. Elevation is 5,300 to 5,320 feet. Average annual precipitation is 13 to 16 inches, and average annual air temperature is 43 to 45 degrees F.

These soils are fine-loamy over sandy or sandy-skeletal, mixed, frigid Calcic Argixerolls.

Typical pedon of a Paynecreek Variant loam in an area of Bluecreek Variant-Paynecreek Variant complex, 0 to 4 percent slopes, about 1,000 feet north and 2,400 feet west of the southeast corner of sec. 12, T. 15 S., R. 2 E., Owyhee County, Idaho.

A—0 to 12 inches; grayish brown (10YR 5/2) loam, very dark grayish brown (10YR 3/2) moist; weak medium subangular blocky structure parting to moderate fine granular; soft, very friable; many very fine and fine roots; many very fine and fine interstitial pores; neutral (pH 7.1); clear wavy boundary.

E—12 to 17 inches; pale brown (10YR 6/3) sandy loam, dark grayish brown (10YR 4/2) moist; weak coarse subangular blocky structure; soft, very friable; many very fine and fine roots; common fine tubular pores; mildly alkaline (pH 7.7); abrupt wavy boundary.

Bt—17 to 22 inches; pale brown (10YR 6/3) loam, dark brown (10YR 4/3) moist; moderate medium prismatic structure parting to strong medium angular blocky; slightly hard, friable, slightly sticky and plastic; common very fine and fine roots; few fine interstitial pores; many thin clay films on faces of peds and lining pores; moderately alkaline (pH 8.3); clear wavy boundary.

Btk—22 to 35 inches; light yellowish brown (10YR 6/4) loam, yellowish brown (10YR 5/4) moist; moderate medium subangular blocky structure; hard, friable, slightly sticky and plastic; few very fine roots; common very fine and fine tubular pores; few thin clay films on faces of peds; strongly effervescent; lime segregated in common medium seams; 5 percent pebbles; strongly alkaline (pH 8.9); clear wavy boundary.

2C—35 to 84 inches; variegated very gravelly sand, variegated but dominantly brown (10YR 5/3) moist; single grain; loose; few very fine roots; moderately alkaline (pH 8.2).

Depth to sand and pebbles and thickness of the solum are 25 to 36 inches. The control section is 20 to 30 percent clay in the upper part.

A horizon: Reaction is slightly acid or neutral.

Bt horizon: Texture is loam or clay loam. Reaction is moderately alkaline or strongly alkaline.

C horizon: Pebble content is 40 to 60 percent.

Petan Series

The Petan series consists of well drained soils on side slopes of tablelands. These soils are shallow to a duripan. They formed in material weathered from basalt. Slope is 4 to 8 percent. Elevation is 5,500 to 5,650 feet. Average annual precipitation is 13 to 15 inches, and average annual air temperature is 43 to 45 degrees F.

These soils are clayey-skeletal, montmorillonitic, frigid, shallow Typic Durixerolls.

Typical pedon of a Petan extremely stony loam in an area of Petan-Deunah-Hatpeak complex, 1 to 8 percent slopes, about 740 feet south and 1,120 feet east of the northwest corner of sec. 15, T. 47 N., R. 51 E., Elko County, Nevada.

A—0 to 7 inches; brown (10YR 5/3) extremely stony loam, very dark grayish brown (10YR 3/2) moist; moderate medium granular structure; slightly hard, friable; many very fine and fine roots; many fine and very fine tubular pores; 5 percent pebbles, 10 percent cobbles, and 30 percent stones; neutral (pH 6.8); clear smooth boundary.

BA—7 to 10 inches; brown (10YR 5/3) very stony loam, dark brown (10YR 3/3) moist; weak medium subangular blocky structure parting to moderate medium granular; slightly hard, friable, slightly sticky and slightly plastic; many very fine and fine roots; many very fine and fine tubular pores; 5 percent pebbles, 10 percent cobbles, and 20 percent stones; slightly acid (pH 6.4); clear wavy boundary.

Bt—10 to 17 inches; yellowish brown (10YR 5/4) very stony clay, dark yellowish brown (10YR 4/4) moist; weak medium prismatic structure parting to strong medium angular blocky; hard, firm, very sticky and very plastic; common very fine and fine roots; few fine interstitial pores; few fine manganese concretions; 5 percent pebbles, 10 percent cobbles, and 30 percent stones; slightly acid (pH 6.4); clear wavy boundary.

Bqm—17 to 21 inches; reddish yellow (7.5YR 6/6) duripan, strong brown (7.5YR 5/6) moist; strong medium platy structure; extremely hard, extremely firm; abrupt wavy boundary.

2R—21 inches; basalt.

From 15 to 50 percent of the surface is covered with stones. The mollic epipedon is 7 to 12 inches thick. The duripan is at a depth of 14 to 20 inches. Bedrock is at a depth of 15 to 23 inches. The control section is 40 to 60 percent clay and 35 to 55 percent rock fragments.

A horizon: Reaction is neutral or slightly acid.

Bt horizon: Texture is very cobbly clay or very stony clay. Reaction is slightly acid to mildly alkaline.

Povey Series

The Povey series consists of very deep, well drained soils on mountainsides. These soils formed in colluvium derived from limestone, siltstone, and sandstone. Slope is 30 to 60 percent. Elevation is 5,500 to 6,800 feet. Average annual precipitation is 16 to 18 inches, and average annual air temperature is 39 to 41 degrees F.

These soils are loamy-skeletal, mixed Pachic Cryoborolls.

Typical pedon of a Povey gravelly loam in an area of Searla-Povey association, 30 to 60 percent slopes, about 350 feet south and 2,700 feet east of the northwest corner of sec. 15, T. 46 N., R. 53 E., Elko County, Nevada.

A1—0 to 10 inches; brown (10YR 4/3) gravelly loam, very dark grayish brown (10YR 3/2) moist; moderate fine granular structure; soft, friable, slightly plastic; many fine and very fine roots; many very fine tubular pores; 30 percent pebbles; slightly acid (pH 6.5); gradual smooth boundary.

A2—10 to 21 inches; brown (10YR 4/3) very gravelly loam, very dark grayish brown (10YR 3/2) moist; moderate fine subangular blocky structure; soft, friable, slightly plastic; many fine and very fine roots; many very fine tubular pores; 40 percent pebbles; neutral (pH 6.9); clear wavy boundary.

Bw—21 to 44 inches; brown (10YR 5/3) very cobbly loam, dark brown (10YR 3/3) moist; weak medium

subangular blocky structure; soft, friable, slightly sticky and slightly plastic; common fine and very fine roots; many very fine tubular pores; 30 percent pebbles and 20 percent cobbles; neutral (pH 7.1); abrupt wavy boundary.

Bk—44 to 46 inches; white (10YR 8/1) very gravelly loam, white (10YR 8/2) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; common fine and very fine roots; few very fine tubular pores; violently effervescent; disseminated lime; 60 percent pebbles and 10 percent cobbles; moderately alkaline (pH 8.2); clear wavy boundary.

C—46 to 60 inches; very pale brown (10YR 7/3) extremely cobbly loam, yellowish brown (10YR 5/4) moist; massive; soft, friable, slightly sticky and slightly plastic; few very fine roots; violently effervescent; disseminated lime; 30 percent pebbles and 40 percent cobbles; mildly alkaline (pH 7.8).

Bedrock is at a depth of 60 inches or more. The control section is 35 to 60 percent rock fragments. Clay content is 10 to 18 percent. The Bk horizon is absent in some pedons.

Bw horizon: Texture is very cobbly loam or very gravelly loam.

Sattley Series

The Sattley series consists of deep, well drained soils dominantly on concave hillsides. These soils formed in colluvium derived dominantly from rhyolite and rhyolitic tuff. Slope is 15 to 40 percent. Elevation is 5,400 to 6,500 feet. Average annual precipitation is 13 to 16 inches, and average annual air temperature is 43 to 45 degrees F.

These soils are loamy-skeletal, mixed, frigid Ultic Argixerolls.

Typical pedon of a Sattley gravelly loam in an area of Cavanaugh-Sattley association, 15 to 40 percent slopes, about 500 feet north and 500 feet west of the southeast corner of sec. 17, T. 46 N., R. 52 E., Elko County, Nevada.

A1—0 to 4 inches; grayish brown (10YR 5/2) gravelly loam, very dark grayish brown (10YR 3/2) moist; weak medium granular structure; soft, very friable; many very fine and fine roots; 10 percent pebbles and 5 percent cobbles; slightly acid (pH 6.5); clear wavy boundary.

A2—4 to 9 inches; grayish brown (10YR 5/2) very gravelly loam, very dark grayish brown (10YR 3/2) moist; moderate medium granular structure; soft, very friable, slightly sticky and plastic; many very fine and fine roots; 35 percent pebbles and 5 percent cobbles; slightly acid (pH 6.4); clear wavy boundary.

Bt1—9 to 18 inches; brown (10YR 5/3) very gravelly clay loam, dark brown (10YR 3/3) moist; moderate coarse subangular blocky structure; slightly hard, friable, sticky and slightly plastic; common very fine and fine roots; common very fine and fine interstitial pores; few thin clay films on faces of peds and lining pores; 25 percent pebbles and 10 percent cobbles; slightly acid (pH 6.4); gradual wavy boundary.

Bt2—18 to 25 inches; pale brown (10YR 6/3) very gravelly clay loam, brown (10YR 4/3) moist; moderate medium and coarse subangular blocky structure; slightly hard, friable, sticky and slightly plastic; common very fine and fine roots; common very fine and fine interstitial pores; few thin clay films on faces of peds; 30 percent pebbles and 10 percent cobbles; slightly acid (pH 6.4); clear wavy boundary.

Bt3—25 to 31 inches; pale brown (10YR 6/3) very gravelly loam, brown (10YR 4/3) moist; weak coarse subangular blocky structure parting to moderate medium subangular blocky; slightly hard, friable, sticky and slightly plastic; few very fine and fine roots; common very fine and fine interstitial pores; few thin clay films on faces of peds; 20 percent pebbles and 15 percent cobbles; slightly acid (pH 6.4); gradual wavy boundary.

BC—31 to 43 inches; light yellowish brown (10YR 6/4) extremely cobbly loam, yellowish brown (10YR 5/4) moist; weak medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few very fine and fine roots; 30 percent pebbles and 50 percent cobbles; slightly acid (pH 6.4); abrupt wavy boundary.

2R—43 inches; fractured rhyolitic tuff.

Bedrock is at a depth of 40 to 60 inches or more. Base saturation is 50 to 75 percent in all or part of the upper 30 inches. The control section is 25 to 35 percent clay and 35 to 50 percent coarse fragments.

A horizon: Reaction is slightly acid or neutral.

Bt horizon: Texture is very gravelly clay loam or very gravelly loam. Reaction is neutral or slightly acid.

BC horizon: The horizon is 50 to 85 percent coarse fragments. Reaction is neutral or slightly acid.

Searla Series

The Searla series consists of very deep, well drained soils on mountainsides. These soils formed in colluvium derived from limestone, siltstone, and sandstone. Slope is 30 to 60 percent. Elevation is 5,500 to 6,800 feet. Average annual precipitation is 14 to 16 inches, and average annual air temperature is 41 to 43 degrees F.

These soils are loamy-skeletal, mixed, frigid Calcic Argixerolls.

Typical pedon of a Searla gravelly loam in an area of Searla-Povey association, 30 to 60 percent slopes, about 910 feet south and 1,300 feet east of the northwest

corner of sec. 15, T. 46 N., R. 53 E., Elko County, Nevada.

A1—0 to 6 inches; brown (10YR 5/3) gravelly loam, very dark grayish brown (10YR 3/2) moist; weak medium granular structure; soft, friable, slightly plastic; many fine and very fine roots; many very fine tubular pores; 20 percent pebbles; neutral (pH 6.9); clear smooth boundary.
A2—6 to 15 inches; brown (10YR 5/3) gravelly loam, very dark grayish brown (10YR 3/2) moist; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common fine and very fine roots; many very fine tubular pores; 30 percent pebbles; neutral (pH 7.1); clear wavy boundary.
Bt—15 to 32 inches; yellowish brown (10YR 5/4) very gravelly clay loam, dark brown (10YR 4/3) moist; moderate coarse subangular blocky structure; slightly hard, friable, slightly sticky and plastic; common fine and very fine roots; common very fine tubular pores; common thin clay films on faces of peds; 45 percent pebbles and 5 percent cobbles; neutral (pH 6.9); abrupt wavy boundary.
Bk—32 to 36 inches; white (10YR 8/2) very gravelly loam, very pale brown (10YR 7/3) moist; massive; hard, friable, slightly plastic; few very fine tubular pores; violently effervescent; disseminated lime; 50 percent pebbles and 10 percent cobbles; moderately alkaline (pH 8.0); gradual wavy boundary.
C—36 to 60 inches; light gray (10YR 7/2) very gravelly sandy loam, pale brown (10YR 6/3) moist; massive; slightly hard, friable, slightly plastic; violently effervescent; disseminated lime; 50 percent pebbles and 5 percent cobbles; moderately alkaline (pH 8.1).

Bedrock is at a depth of 60 inches or more. Secondary lime is at a depth of 25 to 35 inches. The control section is 35 to 60 percent rock fragments.

Bt horizon: Clay content is 27 to 35 percent.

Bk and C horizons: Texture is very gravelly loam or very gravelly sandy loam. Clay content is 10 to 22 percent.

Simonton Series

The Simonton series consists of very deep, well drained soils on alluvial terraces. These soils formed in coarse-textured alluvium derived dominantly from igneous rock. Slope is 1 to 10 percent. Elevation is 5,250 to 5,450 feet. Average annual precipitation is 13 to 16 inches, and average annual air temperature is 43 to 45 degrees F.

These soils are fine-loamy, mixed, frigid Ultic Argixerolls.

Typical pedon of a Simonton coarse sandy loam in an area of Simonton-Thacker, dry complex, 1 to 4 percent slopes, about 350 feet south and 1,400 feet west of the northeast corner of sec. 24, T. 16 S., R. 2 E., Owyhee County, Idaho.

A1—0 to 6 inches; grayish brown (10YR 5/2) coarse sandy loam, very dark grayish brown (10YR 3/2) moist; weak fine granular structure; slightly hard, friable, slightly plastic; many very fine roots and common fine roots; many fine and medium interstitial pores; 10 percent pebbles; neutral (pH 6.7); clear wavy boundary.
A2—6 to 15 inches; brown (10YR 5/3) coarse sandy loam, very dark grayish brown (10YR 3/2) moist; weak coarse subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; many very fine and fine roots; many very fine and fine interstitial pores; 10 percent pebbles; neutral (pH 6.7); clear smooth boundary.
Bt1—15 to 23 inches; pale brown (10YR 6/3) gravelly coarse sandy loam, dark brown (10YR 3/3) moist; weak medium subangular blocky structure; very hard, firm, slightly sticky and slightly plastic; common very fine roots; many very fine interstitial pores and many fine tubular pores; common thin clay films on faces of peds; 18 percent pebbles; neutral (pH 6.7); gradual smooth boundary.
Bt2—23 to 34 inches; yellowish brown (10YR 5/4) gravelly sandy clay loam, dark yellowish brown (10YR 4/4) moist; weak medium subangular blocky structure; very hard, firm, sticky and plastic; common very fine roots; common fine interstitial pores; many thin clay films on faces of peds and lining pores; 25 percent pebbles; neutral (pH 6.6); gradual wavy boundary.
Bt3—34 to 41 inches; yellowish brown (10YR 6/4) gravelly coarse sandy loam, dark brown (10YR 4/3) moist; weak coarse subangular blocky structure; hard, firm, slightly sticky and slightly plastic; common very fine roots; many very fine and fine interstitial pores; few thin clay films on faces of peds and clay bridges between mineral grains; 20 percent pebbles; neutral (pH 6.6); gradual wavy boundary.
C1—41 to 80 inches; variegated very gravelly loamy coarse sand, dominantly yellowish brown (10YR 6/4) and dark brown (10YR 4/3) moist; single grain; loose; common very fine and fine roots; many coarse interstitial pores; 65 percent pebbles; neutral (pH 6.9); clear wavy boundary.
C2—80 to 84 inches; variegated loam; massive; hard, firm, sticky and plastic; neutral (pH 6.8).

The mollic epipedon is 10 to 16 inches thick. Depth to sand and pebbles and thickness of the solum are 30 to 45 inches. Base saturation is 50 to 75 percent in some part of the profile above a depth of 30 inches. The control section is 18 to 32 percent clay. Reaction is slightly acid or neutral.

A horizon: Texture is coarse sandy loam or sandy loam.

Bt horizon: Texture is gravelly coarse sandy loam, gravelly sandy clay loam, sandy loam, or sandy clay loam. Content of pebbles, mostly fine pebbles, is 0 to 25 percent.

Soonahbe Series

The Soonahbe series consists of deep, well drained soils on alluvial terraces and fan piedmonts. These soils formed in loess and mixed alluvium. Slope is 1 to 10 percent. Elevation is 5,300 to 5,600 feet. Average annual precipitation is 13 to 16 inches, and average annual air temperature is 43 to 45 degrees F.

These soils are fine-loamy, mixed, frigid Mollic Haploxeralfs.

Typical pedon of a Soonahbe silt loam, 1 to 3 percent slopes, about 1,100 feet north and 100 feet west of the southeast corner of sec. 30, T. 47 N., R. 52 E., Elko County, Nevada.

A—0 to 6 inches; pale brown (10YR 6/3) silt loam, very dark grayish brown (10YR 3/2) moist; strong thin platy structure; slightly hard, friable, slightly plastic; many very fine and fine roots; common very fine interstitial pores; neutral (pH 6.9); clear smooth boundary.

Bt1—6 to 14 inches; yellowish brown (10YR 5/4) loam, dark brown (10YR 3/3) moist; moderate coarse subangular blocky structure; hard, friable, slightly sticky and slightly plastic; common very fine and fine roots; many very fine and fine and few medium interstitial pores; few thin clay films on faces of peds; few uncoated silt grains on faces of peds; neutral (pH 7.1); clear smooth boundary.

Bt2—14 to 24 inches; light yellowish brown (10YR 6/4) clay loam, brown (10YR 4/3) moist; strong medium subangular blocky structure; very hard, firm, sticky and plastic; common fine roots; common very fine and fine interstitial pores; common thin and few moderately thick clay films on faces of peds; common uniformly distributed coarse cylindrical nodules with color and texture similar to those of the matrix; neutral (pH 7.0); gradual smooth boundary.

Bt3—24 to 31 inches; light yellowish brown (10YR 6/4) loam, dark yellowish brown (10YR 4/4) moist; strong medium subangular blocky structure; very hard, firm, slightly sticky and slightly plastic; common fine roots; few very fine interstitial pores; few thin clay films on faces of peds; many uniformly distributed coarse cylindrical nodules with color and texture similar to those of the matrix; neutral (pH 7.0); gradual wavy boundary.

C—31 to 46 inches; very pale brown (10YR 7/4) silt loam, dark yellowish brown (10YR 4/4) moist; massive; slightly hard, firm; common very fine and fine roots; many very fine and fine interstitial pores; several large krotovinas; neutral (pH 7.3); clear wavy boundary.

Cqkmb—46 to 59 inches; very pale brown (10YR 7/3) duripan, brown (10YR 4/3) moist; massive; extremely hard, extremely firm; few fine roots concentrated along fracture planes; few fine interstitial pores; strongly effervescent; many medium seams of lime; common fine dark-colored concretions and stains of manganese oxide; moderately alkaline (pH 8.0); gradual wavy boundary.

Cqkb—59 to 80 inches; very pale brown (10YR 7/3) silt loam, dark yellowish brown (10YR 3/4) moist; massive; hard, firm; few fine roots; many very fine and fine interstitial pores; slightly effervescent; few fine filaments of lime; few fine dark-colored concretions of manganese oxide; moderately alkaline (pH 7.9); clear wavy boundary.

C'—80 to 84 inches; variegated gravelly coarse sand; single grain; loose.

The solum is 30 to 44 inches thick. The duripan is at a depth of 42 to 52 inches. The control section is 22 to 32 percent clay.

A horizon: Reaction is neutral or mildly alkaline.

Bt horizon: Reaction is slightly acid to mildly alkaline.

C horizon: Texture is loam or silt loam. Reaction is neutral to moderately alkaline.

Cqkmb horizon: Reaction is moderately alkaline or strongly alkaline.

Soonahbe Variant

The Soonahbe Variant consists of well drained soils on hillsides. These soils are moderately deep to bedrock. They formed in rhyolitic tuff influenced by mixed alluvium. Slope is 2 to 15 percent. Elevation is 5,300 to 5,600 feet. Average annual precipitation is 13 to 16 inches, and average annual air temperature is 43 to 45 degrees F.

These soils are fine-loamy, mixed, frigid Mollic Haploxeralfs.

Typical pedon of a Soonahbe Variant fine sandy loam in an area of Soonahbe Variant-Bulake complex, 2 to 15 percent slopes, about 2,400 feet north and 1,100 feet west of the southwest corner of sec. 36, T. 46 N., R. 50 E., Elko County, Nevada.

A1—0 to 3 inches; pale brown (10YR 6/3) fine sandy loam, dark brown (10YR 3/3) moist; moderate thick platy structure; soft, friable; many very fine and fine roots; many very fine and fine vesicular pores; neutral (pH 6.7); clear smooth boundary.

A2—3 to 8 inches; light yellowish brown (10YR 6/4) loam, dark brown (10YR 3/3) moist; weak medium subangular blocky structure parting to moderate fine granular; soft, friable, slightly plastic; many very fine

and fine roots; many very fine and fine tubular pores; neutral (pH 6.9); clear wavy boundary.
BA—8 to 12 inches; light yellowish brown (10YR 6/4) loam, dark yellowish brown (10YR 4/4) moist; moderate medium subangular blocky structure; soft, friable, slightly plastic; common very fine and fine roots; many very fine and fine tubular pores; neutral (pH 7.1); clear wavy boundary.
Bt—12 to 21 inches; light yellowish brown (10YR 6/4) loam, dark yellowish brown (10YR 4/4) moist; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine and fine roots; common very fine and fine tubular pores; common thin clay films on faces of peds and lining pores; 5 percent pebbles; neutral (pH 7.3); clear wavy boundary.
BC—21 to 28 inches; very pale brown (10YR 7/4) gravelly sandy loam, dark yellowish brown (10YR 4/4) moist; moderate fine subangular blocky structure; slightly hard, friable, slightly plastic; few very fine roots; few fine interstitial pores; 25 percent pebbles; mildly alkaline (pH 7.6); gradual wavy boundary.
2R—28 inches; rhyolitic tuff.

Depth to bedrock and thickness of the solum are 20 to 40 inches. The control section is 18 to 25 percent clay. Reaction is neutral or mildly alkaline.

Strickland Series

The Strickland series consists of moderately deep, well drained soils on basalt plateaus. These soils formed in slope alluvium derived dominantly from basalt and tuff. Slope is 2 to 25 percent. Elevation is 6,500 to 7,800 feet. Average annual precipitation is 18 to 22 inches, and average annual air temperature is 35 to 40 degrees F.

These soils are fine-loamy, mixed Pachic Cryoborolls.

Typical pedon of a Strickland loam in an area of Strickland-Bluebell complex, 2 to 20 percent slopes, about 1,200 feet north and 100 feet east of the southwest corner of sec. 16, T. 47 N., R. 53 E., Elko County, Nevada.

A—0 to 13 inches; yellowish brown (10YR 5/4) loam, dark brown (7.5YR 3/2) moist; weak medium subangular blocky structure parting to moderate fine granular; slightly hard, friable, slightly sticky and slightly plastic; common very fine, fine, and medium roots; few very fine interstitial pores; 5 percent pebbles; medium acid (pH 5.6); clear wavy boundary.
Bt1—13 to 18 inches; brown (7.5YR 5/4) loam, dark brown (7.5YR 3/2) moist; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and plastic; common very fine and fine roots; few very fine interstitial pores; common thin clay films on faces of peds; 5 percent pebbles; medium acid (pH 5.7); clear wavy boundary.
Bt2—18 to 28 inches; brown (7.5YR 5/4) loam, dark brown (7.5YR 4/4) moist; moderate coarse subangular blocky structure; slightly hard, friable, slightly sticky and plastic; few very fine and fine roots; common very fine tubular pores; common thin clay films on faces of peds; 10 percent cobbles and pebbles; medium acid (pH 5.6); clear wavy boundary.
2R—28 inches; fractured tuff.

Depth to bedrock and thickness of the solum are 20 to 40 inches. Base saturation is 50 to 75 percent in the entire profile. Reaction is slightly acid to strongly acid.

B horizon: Texture is loam or cobbly loam. Coarse fragment content is 5 to 30 percent.

Thacker Series

The Thacker series consists of well drained soils on piedmonts and alluvial terraces. These soils are moderately deep to a duripan. They formed in mixed alluvium. Slope is 1 to 10 percent. Elevation is 5,270 to 5,600 feet. Average annual precipitation is 13 to 16 inches, and average annual air temperature is 43 to 45 degrees F.

These soils are fine, montmorillonitic, frigid Abruptic Durixeralfs.

Typical pedon of a Thacker loam in an area of Thacker-Simonton complex, 1 to 4 percent slopes, about 3,150 feet south and 3,500 feet east of the northwest corner of sec. 29, T. 16 S., R. 3 E., Owyhee County, Idaho.

E1—0 to 4 inches; pale brown (10YR 6/3) loam, dark grayish brown (10YR 4/2) moist; moderate thin platy structure; slightly hard, friable, slightly sticky and slightly plastic; many very fine, fine, and medium roots; many fine and medium vesicular pores; neutral (pH 6.6); clear smooth boundary.
E2—4 to 12 inches; pale brown (10YR 6/3) gravelly loam, dark brown (10YR 4/3) moist; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine, fine, and medium roots; many very fine and fine interstitial pores; few light gray (10YR 7/2) silt coatings on faces of peds; 15 percent pebbles; neutral (pH 6.9); abrupt smooth boundary.
Bt—12 to 21 inches; dark yellowish brown (10YR 4/4) clay, dark yellowish brown (10YR 4/4) moist; strong medium columnar structure; very hard, firm, very sticky and very plastic; common very fine and medium roots; few very fine tubular pores; common moderately thick clay films on faces of peds and in pores; many pressure faces; columns are capped

with light gray (10YR 7/2) silt; neutral (pH 7.3); abrupt wavy boundary.

2Cqkm—21 to 30 inches; light yellowish brown (10YR 6/4) indurated duripan, dark yellowish brown (10YR 4/4) moist; strong medium platy structure; very hard, very firm; brittle when moist; few very fine roots; continuous silica coatings 1 millimeter thick on surfaces of plates; slightly effervescent; lime segregated in few medium seams; common fine dark-colored concretions and stains of manganese oxide; moderately alkaline (pH 8.0); gradual smooth boundary.

Cq—30 to 43 inches; variegated but dominantly light yellowish brown (10YR 6/4) extremely gravelly sand, dark yellowish brown (10YR 4/4) moist; massive; hard, friable; many very fine and fine interstitial pores; slightly cemented; moderately alkaline (pH 8.2); gradual smooth boundary.

2C—43 to 84 inches; variegated strata of gravelly sand and sand; single grain; loose; many interstitial pores; moderately alkaline (pH 7.9).

The solum is 20 to 35 inches thick. The duripan is at a depth of 20 to 40 inches.

E horizon: Reaction is slightly acid or neutral.

Bt horizon: Clay content is 50 to 60 percent. Reaction is slightly acid to mildly alkaline.

Cqkm horizon: Rock fragment content is 0 to 30 percent.

Torney Variant

The Torney Variant consists of very deep, well drained soils in basins and drainageways on basalt tablelands. These soils formed in alluvium. Slope is 0 to 2 percent. Elevation is 5,500 to 5,800 feet. Average annual precipitation is 13 to 16 inches, and average annual air temperature is 43 to 45 degrees F.

These soils are fine, montmorillonitic, frigid Ultic Palexerolls.

Typical pedon of Torney Variant silt loam, in an area of Burmah Variant-Torney Variant-Yatahoney complex, 0 to 2 percent slopes, about 1,550 feet south and 90 feet west of the northeast corner of sec. 30, T. 47 N., R. 51 E., Elko County, Nevada.

A1—0 to 8 inches; brown (10YR 5/3) silt loam, dark brown (10YR 3/3) moist; weak medium subangular blocky structure parting to moderate medium granular; slightly hard, friable, sticky and plastic; many fine and very fine roots; many very fine tubular pores; few fine dark-colored concretions of manganese oxide; slightly acid (pH 6.5); clear smooth boundary.

A2—8 to 13 inches; brown (10YR 5/3) silt loam, dark brown (10YR 3/3) moist; moderate medium subangular blocky structure parting to moderate medium granular; slightly hard, friable, sticky and plastic; many fine and very fine roots; many very fine tubular pores; few fine dark-colored concretions of manganese oxide; slightly acid (pH 6.5); clear wavy boundary.

BA—13 to 17 inches; pale brown (10YR 6/3) silty clay loam, dark brown (10YR 3/3) moist; strong fine angular blocky structure; slightly hard, friable, sticky and plastic; many fine and very fine roots; many very fine pores; 40 percent uncoated silt on faces of peds; few fine dark-colored concretions of manganese oxide; slightly acid (pH 6.5); abrupt wavy boundary.

Bt1—17 to 25 inches; light yellowish brown (10YR 6/4) clay, dark yellowish brown (10YR 3/4) moist; moderate medium columnar structure; hard, firm, very sticky and very plastic; common fine and very fine roots; few very fine tubular pores; few thin clay films on faces of peds; common fine dark-colored concretions of manganese oxide; slightly acid (pH 6.5); gradual wavy boundary.

Bt2—25 to 48 inches; light yellowish brown (10YR 6/4) silty clay loam, dark yellowish brown (10YR 4/4) moist; weak medium angular blocky structure; hard, friable, sticky and plastic; few fine and very fine roots; common very fine tubular pores; few thin clay films on faces of peds; common fine dark-colored concretions of manganese oxide; neutral (pH 7.1); diffuse wavy boundary.

C—48 to 60 inches; very pale brown (10YR 7/4) silt loam, yellowish brown (10YR 5/4) moist; massive; hard, friable, sticky and plastic; few fine and very fine roots; few very fine tubular pores; common fine dark-colored concretions of manganese oxide; mildly alkaline (pH 7.8).

A and BA horizons: Texture is silty clay loam or silt loam. Reaction is slightly acid or neutral.

Bt horizon: Clay content is 28 to 50 percent.

C horizon: Clay content is 20 to 26 percent. Reaction is neutral or mildly alkaline.

Tucker Series

The Tucker series consists of very deep, somewhat poorly drained soils on flood plains. These soils formed in mixed alluvium. Slope is 0 to 2 percent. Elevation is 5,270 to 5,400 feet. Average annual precipitation is 13 to 16 inches, and average annual air temperature is 43 to 45 degrees F.

These soils are fine, montmorillonitic, frigid Cumulic Haploxerolls.

Typical pedon of Tucker silty clay loam, gravelly substratum, 0 to 2 percent slopes, about 1,900 feet north and 2,400 feet west of the southeast corner of sec. 35, T. 15 S., R. 2 E., Owyhee County, Idaho.

A1—0 to 2 inches; light brownish gray (10YR 6/2) silt loam, black (10YR 2/1) moist; weak coarse subangular blocky structure parting to weak thin platy; soft, friable, slightly plastic; many very fine and fine roots and common medium roots; common very fine interstitial pores and common fine tubular pores; slightly acid (pH 6.1); clear wavy boundary.

2A2—2 to 13 inches; gray (10YR 5/1) silty clay, black (10YR 2/1) moist; moderate medium columnar structure; very hard, firm, sticky and very plastic; many very fine and fine roots and common medium roots; many fine and common very fine tubular pores; many pressure faces; few slickensides; uncoated silt grains on tops of columns; mildly alkaline (pH 7.8); gradual smooth boundary.

2Bk1—13 to 22 inches; gray (10YR 5/1) silty clay, very dark gray (10YR 3/1) moist; moderate coarse prismatic structure parting to moderate medium subangular blocky; very hard, friable, sticky and very plastic; many very fine and fine roots and common medium roots; many very fine and common fine tubular pores; common pressure faces; slightly effervescent; lime segregated in common fine irregular soft masses; mildly alkaline (pH 7.8); gradual wavy boundary.

2Bk2—22 to 38 inches; white (5Y 8/1) clay loam, dark grayish brown (2.5Y 4/2, moist) broken face, grayish brown (2.5Y 5/2, moist) crushed; weak coarse prismatic structure parting to moderate fine subangular blocky; slightly hard, friable, sticky and plastic; common very fine and few medium roots; many very fine, common fine, and few medium tubular pores; common pressure faces; common fine manganese concretions; violently effervescent; disseminated lime; mildly alkaline (pH 7.6); diffuse wavy boundary.

2Bky—38 to 46 inches; light gray (5Y 7/2) loam, dark grayish brown (2.5Y 4/2) moist, grayish brown (2.5Y 5/2, moist) crushed; weak fine prismatic structure parting to moderate medium subangular blocky; slightly hard, friable, slightly sticky and plastic; common very fine and fine roots; common very fine interstitial pores; common pressure faces; strongly effervescent; lime segregated in common fine seams and few fine concretions; few gypsum coatings in root channels; mildly alkaline (pH 7.6); clear wavy boundary.

3C—46 to 84 inches; strata of very gravelly coarse sand to very gravelly sandy loam.

The solum is 25 to 46 inches thick. Depth to sand and pebbles is 40 inches or more. The control section is 35 to 50 percent clay.

A horizon: Reaction is slightly acid to mildly alkaline.

B horizon: Texture is silty clay loam, silty clay, clay, clay loam, or loam. Reaction is neutral or mildly alkaline.

Tucker Variant

The Tucker Variant consists of very deep, somewhat poorly drained soils on flood plains. These soils formed in mixed alluvium. Slope is 0 to 2 percent. Elevation is 5,300 to 5,310 feet. Average annual precipitation is 13 to 16 inches, and average annual air temperature is 43 to 45 degrees F.

These soils are clayey over sandy or sandy-skeletal, mixed, frigid Fluvaquentic Haploxerolls.

Typical pedon of Tucker Variant silty clay loam, 0 to 2 percent slopes, about 1,850 feet north and 600 feet east of the southwest corner of sec. 13, T. 15 S., R. 2 E., Owyhee County, Idaho.

A1—0 to 2 inches; gray (10YR 5/1) silt loam, black (10YR 2/1) moist; weak very fine granular structure; soft, very friable, slightly sticky; common very fine and fine roots; many very fine interstitial pores; slightly acid (pH 6.5); abrupt smooth boundary.

A2—2 to 7 inches; gray (10YR 5/1) silty clay loam, very dark gray (10YR 3/1) moist; weak medium platy structure parting to moderate fine granular; soft, very friable, sticky and plastic; common very fine and fine roots; many very fine and fine interstitial pores; few light gray (10YR 6/1) uncoated silt grains on faces of peds; mildly alkaline (pH 7.5); abrupt wavy boundary.

2Bk1—7 to 18 inches; dark gray (10YR 4/1) clay, very dark gray (10YR 3/1) moist; weak medium prismatic structure parting to strong medium subangular blocky; hard, friable, sticky and very plastic; common very fine and fine roots; common very fine and fine tubular pores; strongly effervescent; lime segregated in few fine soft masses; mildly alkaline (pH 7.5); clear wavy boundary.

2Bk2—18 to 23 inches; variegated but dominantly light brownish gray (10YR 6/2) clay, very dark grayish brown (2.5Y 3/2) moist, dark grayish brown (2.5Y 4/2, moist) crushed; moderate medium subangular blocky structure; hard, friable, sticky and plastic; few very fine and fine roots; common very fine and fine tubular pores; violently effervescent; lime segregated in common fine soft masses; mildly alkaline (pH 7.8); clear wavy boundary.

2Bw—23 to 27 inches; light brownish gray (2.5Y 6/2) clay loam, very dark grayish brown (2.5Y 3/2) moist; moderate fine angular blocky structure; slightly hard, friable, sticky and plastic; few very fine and fine roots; few very fine interstitial pores; mildly alkaline (pH 7.8); abrupt wavy boundary.

3C—27 to 60 inches; variegated very gravelly sand, variegated but dominantly grayish brown (10YR 5/2) moist; single grain; loose; 50 percent pebbles; mildly alkaline (pH 7.6).

Depth to sand and gravel and thickness of the solum are 20 to 40 inches. The control section is 35 to 50 percent clay in the upper part. Below a depth of 40 inches, some profiles have layers of sand and gravel that are weakly cemented to strongly cemented by iron and manganese.

A horizon: Reaction is slightly acid to mildly alkaline.

2B horizon: Texture is clay and clay loam. Reaction is neutral or mildly alkaline.

3C horizon: Pebble content is 35 to 50 percent.

Wagonbox Series

The Wagonbox series consists of well drained soils on summits and side slopes of tablelands. These soils are shallow to a duripan. They formed in residuum derived dominantly from basalt. Slope is 2 to 8 percent. Elevation is 5,400 to 6,600 feet. Average annual precipitation is 13 to 16 inches, and average annual air temperature is 43 to 45 degrees F.

These soils are clayey-skeletal, montmorillonitic, frigid, shallow Typic Durixeralfs.

Typical pedon of a Wagonbox rubbly silty clay loam in an area of Wickahoney-Wagonbox complex, 2 to 8 percent slopes, about 2,200 feet north and 1,000 feet west of the southwest corner of sec. 26, T. 16 S., R. 1 E., Owyhee County, Idaho.

A—0 to 5 inches; brown (10YR 5/3) rubbly silty clay loam, dark brown (10YR 3/3) moist; strong fine granular structure; slightly hard, friable, sticky and plastic; many very fine and fine roots; 65 percent stones; slightly acid (pH 6.3); clear smooth boundary.

Bt1—5 to 8 inches; yellowish brown (10YR 5/4) very stony clay, dark yellowish brown (10YR 4/4) moist; weak medium subangular blocky structure parting to strong medium granular; hard, firm, sticky and plastic; many very fine and fine roots; few thin clay films on faces of peds; few uncoated silt grains on faces of peds; 60 percent stones; slightly acid (pH 6.3); clear smooth boundary.

Bt2—8 to 17 inches; yellowish brown (10YR 5/4) very stony clay, dark yellowish brown (10YR 4/4) moist; moderate medium prismatic structure; very hard, firm, very sticky and very plastic; common very fine and fine roots; common thin clay films on faces of peds; few slickensides; 60 percent stones; neutral (pH 7.1); abrupt irregular boundary.

Bqm—17 to 23 inches; very pale brown (10YR 8/4) indurated duripan, yellowish brown (10YR 5/6) moist; massive; hard, firm; silica laminae about 1 millimeter thick; pan is discontinuous where stones and boulders occur; 50 percent stones and 30 percent boulders; abrupt broken boundary.

R—23 inches; basalt.

The duripan is at a depth of 11 to 20 inches. Bedrock is at a depth of 12 to 23 inches. The control section is 40 to 60 percent rock fragments. From 50 to 75 percent of the surface is covered with stones.

A horizon: Reaction is slightly acid or neutral.

Bt horizon: Texture is very stony clay and very cobbly clay or clay loam. Clay content is 35 to 55 percent. Reaction is slightly acid or neutral.

Bqm horizon: Rock fragment content is 40 to 80 percent.

Watchabob Series

The Watchabob series consists of well drained soils on hillsides. These soils are moderately deep to granite. They formed in colluvium derived dominantly from granite. Slope is 10 to 40 percent. Elevation is 5,600 to 6,800 feet. Average annual precipitation is 13 to 16 inches, and average annual air temperature is 43 to 45 degrees F.

These soils are fine-loamy, mixed, frigid Pachic Ultic Argixerolls.

Typical pedon of a Watchabob gravelly coarse sandy loam in an area of Watchabob-Bearskin Variant complex, 10 to 40 percent slopes, about 1,800 feet north and 2,400 feet east of the southwest corner of sec. 27, T. 46 N., R. 53 E., Elko County, Nevada.

A1—0 to 5 inches; dark grayish brown (10YR 4/2) gravelly coarse sandy loam, very dark brown (10YR 2/2) moist; weak fine granular structure; soft, very friable; many very fine and fine roots and few medium roots; common very fine and fine tubular pores; 20 percent pebbles; slightly acid (pH 6.5); clear smooth boundary.

A2—5 to 9 inches; brown (10YR 5/3) gravelly coarse sandy loam, very dark grayish brown (10YR 3/2) moist; weak fine subangular blocky structure; soft, friable; many very fine and fine roots and few medium roots; common very fine tubular pores; 25 percent pebbles; slightly acid (pH 6.4); clear wavy boundary.

A3—9 to 15 inches; brown (10YR 5/3) gravelly coarse sandy loam, very dark grayish brown (10YR 3/2) moist; moderate medium and coarse subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine and fine roots and few medium roots; common very fine tubular pores; 20 percent pebbles; slightly acid (pH 6.4); gradual wavy boundary.

Bt1—15 to 21 inches; grayish brown (10YR 5/2) gravelly coarse sandy loam, very dark grayish brown (10YR 3/2) moist; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine and fine roots; common very fine tubular pores; few thin clay films on faces of peds and lining pores; 25 percent

pebbles; slightly acid (pH 6.5); gradual wavy boundary.
Bt2—21 to 26 inches; brown (10YR 5/3) gravelly sandy clay loam, dark brown (10YR 3/3) moist; moderate coarse subangular blocky structure; slightly hard, friable, sticky and slightly plastic; common very fine and fine roots; common very fine tubular pores; few thin clay films on faces of peds and lining pores; 25 percent pebbles; slightly acid (pH 6.4); clear wavy boundary.
C—26 to 28 inches; variegated extremely gravelly coarse sandy loam, dominantly dark yellowish brown (10YR 3/4) moist; single grain; loose, nonsticky and nonplastic; few very fine and fine roots; common very fine and fine interstitial pores; 75 percent pebbles; strongly acid (pH 5.4); clear wavy boundary.
2R—28 inches; granite.

Depth to bedrock and thickness of the solum are 20 to 40 inches. The control section is 20 to 30 percent pebbles. Base saturation is 50 to 75 percent in all or part of the upper 30 inches of the profile. The C horizon is absent in some pedons.

A horizon: Reaction is neutral to medium acid.

Bt horizon: Texture is gravelly sandy clay loam or gravelly coarse sandy loam. Clay content is 18 to 30 percent. Reaction is neutral to medium acid.

Wickahoney Series

The Wickahoney series consists of well drained soils on summits and side slopes of foothills and on summits of tablelands. These soils are shallow to bedrock. They formed in residuum derived dominantly from rhyolite, welded rhyolitic tuff, or basalt. Slope is 2 to 30 percent. Elevation is 5,300 to 7,200 feet. Average annual precipitation is 13 to 16 inches, and average annual air temperature is 39 to 45 degrees F.

These soils are clayey-skeletal, montmorillonitic, frigid Lithic Mollic Haploxeralfs.

Typical pedon of a Wickahoney rubbly silt loam in an area of Wickahoney-Wagonbox complex, 2 to 8 percent slopes, about 3,600 feet south and 500 feet west of the northeast corner of sec. 3, T. 15 S., R. 3 E., Owyhee County, Idaho.

A1—0 to 4 inches; light brownish gray (10YR 6/2) rubbly silt loam, very dark grayish brown (10YR 3/2) moist; moderate medium platy structure; hard, friable, slightly sticky and plastic; many very fine and fine roots; many very fine and fine vesicular pores; 10 percent pebbles, 20 percent cobbles, and 40 percent stones; slightly acid (pH 6.3); clear wavy boundary.
A2—4 to 6 inches; grayish brown (10YR 5/2) cobbly clay loam, dark brown (10YR 3/3) moist; moderate fine and medium granular structure; soft, friable, sticky and plastic; many very fine and fine roots; common fine interstitial pores; 5 percent pebbles and 10 percent cobbles; slightly acid (pH 6.1); clear wavy boundary.
Bt1—6 to 10 inches; brown (10YR 5/3) very cobbly clay, dark brown (10YR 4/3) moist; strong coarse subangular blocky structure; very hard, firm, very sticky and very plastic; common very fine and fine roots; few fine interstitial pores; many thin clay films on faces of peds and lining pores; many pressure faces; 10 percent pebbles and 25 percent cobbles; slightly acid (pH 6.3); gradual irregular boundary.
Bt2—10 to 16 inches; brown (10YR 5/3) very cobbly clay, dark brown (10YR 4/3) moist; moderate medium and coarse subangular blocky structure; very hard, firm, very sticky and very plastic; common very fine and fine roots; few fine interstitial pores; many thin clay films on faces of peds and lining pores; many pressure faces; 50 percent cobbles; slightly acid (pH 6.3); abrupt irregular boundary.
2R—16 inches; basalt.

Bedrock is at a depth of 10 to 20 inches. An E horizon is present in some pedons.

A horizon: Reaction is slightly acid or neutral. Texture is rubbly silt loam or stony loam.

Bt horizon: Texture is very cobbly clay, very gravelly clay, or clay loam. Clay content is 35 to 55 percent. Rock fragment content is 35 to 60 percent. Reaction is slightly acid to mildly alkaline.

Yatahoney Series

The Yatahoney series consists of well drained soils on basin floors and on toe slopes and alluvial fan terraces of adjacent tablelands. These soils are moderately deep to a duripan. They formed in alluvium derived dominantly from basalt and rhyolite. Slope is 1 to 10 percent. Elevation is 5,290 to 6,000 feet. Average annual precipitation is 13 to 16 inches, and average annual air temperature is 43 to 45 degrees F.

These soils are fine, montmorillonitic, frigid Typic Durixeralfs.

Typical pedon of a Yatahoney loam in an area of Yatahoney-Soonahbe complex, 2 to 10 percent slopes, about 350 feet south and 300 feet east of the northwest corner of sec. 2, T. 46 N., R. 50 E., Elko County, Nevada.

A—0 to 4 inches; very pale brown (10YR 7/3) loam, dark brown (10YR 3/3) moist; weak medium platy structure; slightly hard, friable, slightly sticky and plastic; many very fine and fine roots; neutral (pH 6.8); clear smooth boundary.
Bt1—4 to 9 inches; light yellowish brown (10YR 6/4) clay loam, dark brown (10YR 4/3) moist; moderate medium subangular blocky structure; slightly hard,

friable, sticky and plastic; many very fine and fine roots; very few thin clay films on faces of peds; 30 percent uncoated silt grains on faces of peds; neutral (pH 6.8); clear wavy boundary.

Bt2—9 to 15 inches; light yellowish brown (10YR 6/4) clay, dark yellowish brown (10YR 4/4) moist; strong fine angular blocky structure; hard, friable, sticky and very plastic; common very fine and fine roots; common moderately thick clay films on faces of peds; neutral (pH 7.0); abrupt smooth boundary.

Bt3—15 to 25 inches; brownish yellow (10YR 6/6) clay, dark yellowish brown (10YR 4/4) moist; strong medium prismatic structure parting to strong medium angular blocky; very hard, firm, very sticky and very plastic; common very fine and fine roots; many thin clay films on faces of peds; mildly alkaline (pH 7.5); clear wavy boundary.

Bkqm—25 to 32 inches; very pale brown (10YR 7/3) indurated duripan; medium platy structure; violently effervescent; seams of lime between plates; moderately alkaline (pH 7.9); abrupt wavy boundary.

2R—32 inches; rhyolitic tuff.

Depth to the duripan and thickness of the solum are 20 to 38 inches. From 0 to 50 percent of the surface is covered with cobbles.

A horizon: Reaction is neutral or slightly acid.

Bt horizon: Texture is clay loam or clay. Clay content is 40 to 55 percent. Reaction is neutral or mildly alkaline.

Zola Series

The Zola series consists of very deep, moderately well drained soils on flood plains and low terraces. These soils formed in recent stratified alluvium derived from mixed sources. Slope is 0 to 2 percent. Elevation is 5,260 to 5,600 feet. Average annual precipitation is 13 to 16 inches, and average annual air temperature is 43 to 45 degrees F.

These soils are fine-loamy, mixed, frigid Cumulic Haploxerolls.

Typical pedon of Zola loam, 0 to 2 percent slopes, about 515 feet south and 1,170 feet west of the northeast corner of sec. 16, T. 47 N., R. 52 E., Elko County, Nevada.

Ap—0 to 7 inches; grayish brown (10YR 5/2) loam, very dark gray (10YR 3/1) moist; moderate fine granular structure; slightly hard, friable, slightly sticky and plastic; many very fine and fine roots; many very fine tubular and interstitial pores; mildly alkaline (pH 7.7); clear smooth boundary.

AB1—7 to 16 inches; grayish brown (10YR 5/2) loam, very dark grayish brown (10YR 3/2) moist; weak medium subangular blocky structure; slightly hard, friable, slightly sticky and plastic; common very fine and fine roots; many very fine tubular pores; mildly alkaline (pH 7.6); clear smooth boundary.

AB2—16 to 28 inches; grayish brown (10YR 5/2) silty clay loam, very dark grayish brown (10YR 3/2) moist; moderate fine angular blocky structure; hard, friable, sticky and plastic; common very fine and fine roots; common very fine tubular pores; moderately alkaline (pH 8.0); clear wavy boundary.

Bk—28 to 45 inches; light brownish gray (2.5Y 6/2) loam, very dark grayish brown (2.5Y 3/2) moist; moderate fine subangular blocky structure; slightly hard, firm, slightly sticky and slightly plastic; few very fine roots; many very fine tubular and interstitial pores; strongly effervescent; lime segregated in many fine seams; common dark-colored coatings of organic matter on faces of peds; moderately alkaline (pH 8.1); clear smooth boundary.

C1—45 to 65 inches; light brownish gray (2.5Y 6/2) loam, very dark grayish brown (2.5Y 3/2) moist; common fine prominent light olive brown (2.5Y 5/6, moist) mottles; massive; slightly hard, friable, slightly sticky and slightly plastic; few very fine roots; many very fine and fine tubular pores; mildly alkaline (pH 7.6); clear wavy boundary.

2C2—65 to 73 inches; variegated loamy coarse sand that is dominantly light brownish gray (2.5Y 6/2), dark grayish brown (2.5Y 4/2) moist; single grain; soft, loose; mildly alkaline (pH 7.6); clear wavy boundary.

3Cg—73 to 84 inches; light brownish gray (2.5Y 6/2) clay loam, dark grayish brown (2.5Y 4/2) moist; massive; hard, friable, sticky and plastic; common iron and manganese stains; mildly alkaline (pH 7.4).

The mollic epipedon is 24 to 32 inches thick. Depth to mottles is 36 to 54 inches. The control section is 27 to 33 percent clay.

A and AB horizons: Reaction is neutral or moderately alkaline.

Formation of the Soils

By Thomas W. Hahn, soil scientist, Soil Conservation Service.

Soil is a natural body that covers the land surface of the Earth and in which plants grow. It is a fundamental part of the ecosystem and exists in balance with the other components of the environment.

Soils are characterized by their vertical sequence of layers, or horizons, that vary in color, texture, chemistry, or structure or in a combination of these properties. Horizons are continually forming and evolving, usually over long periods of time, in response to environmental forces. These forces, or soil forming factors, are parent material, climate, biological forces, relief, and time. The combined action of these forces results in soil formation, although one or two forces may predominate. A particular set of soil forming factors gives rise to unique soil profiles.

In this section, the relatively uniform climatic factor is discussed first; the additional factors—parent material, biological forces, relief, and time—are discussed collectively within geomorphic headings.

Climate has a strong influence on soil development. It affects the weathering of minerals, the activity of micro-organisms, and the degree of water movement through the soil. Climate also influences the kind and amount of vegetation, which in turn affects soil formation.

The present climate of the survey area affects many soil profile characteristics; however, different climates throughout the Quaternary have influenced the development of some of the older soils. The impact of those prehistoric climates is not documented for this survey area.

The present climate of the area is that of a cold, midlatitude steppe (Trewartha's modified Koppen system (*10*). Summers are warm and dry, and winters are cold and moist. At higher elevations, temperatures are cooler and precipitation is greater.

The weather in summer is dominated by a dry continental airmass that blocks the advance of most storm systems. Long periods of dry, sunny weather are frequent. The scant precipitation received in summer is primarily from scattered thunderstorms (*7*).

The winter weather is influenced by moist maritime airmasses moving eastward from the Pacific Ocean. Frequent low-pressure storm systems move through the area, resulting in periods of cloudiness and precipitation. Intrusions of cold arctic airmasses are rare because of the shielding effect of the Rocky Mountains to the north. Winters are often snowy, but frequent thaws prevent snow from staying on the ground for long periods, except during unusually cold winters or in the mountains.

The average annual soil temperature (45 to 47 degrees F) places most soils in the survey area in the frigid soil temperature regime. At the higher elevations, generally above 6,500 feet, and especially on north and east aspects, the average summer soil temperature is cool; these soils have a cryic temperature regime. Cool soil temperatures tend to reduce mineral decomposition and microbial activity so that organic matter accumulates in the soil and darkens the surface layer.

The amount and distribution of precipitation in the survey area places most of the well drained soils in the xeric soil moisture regime. Soils on the poorly drained bottom lands are in the aquic soil moisture regime because high ground water levels keep the soil saturated for prolonged periods.

The annual soil-water balance for Owyhee is shown in fig. 4 (*6*). These data are representative of the valley and tablelands in the survey area. As is typical in a xeric soil moisture regime, the soils accumulate moisture from fall through the following spring. In spring, usually in mid-April, plants start to grow and begin to use the stored moisture. By midsummer, usually mid-July, soil moisture is depleted and precipitation is scant, plant growth stops, and the grasses and forbs dry out and become dormant. The soil remains dry until fall, typically until late in October, when precipitation begins to recharge soil moisture and the cycle is repeated.

At the higher elevations, annual precipitation increases to 20 inches or more. Temperatures are cooler, and the growing season is shorter. Evapotranspiration is reduced, and the soils stay moist longer. Soil moisture regimes are xeric grading toward udic.

The precipitation that infiltrates the soil in winter and spring is effective in leaching soil components such as carbonates, basic cations, and clay; however, leaching is not sufficient to remove these entirely from the profile. In horizons where clay has accumulated, an argillic horizon has formed. A duripan has formed where silica, probably from the weathering of volcanic glass, has precipitated and cemented the soil. Thacker soils, Abruptic Durixeralfs, exhibit a pronounced argillic horizon and duripan. In some soils carbonates have accumulated at a depth of 20 to 40 inches.

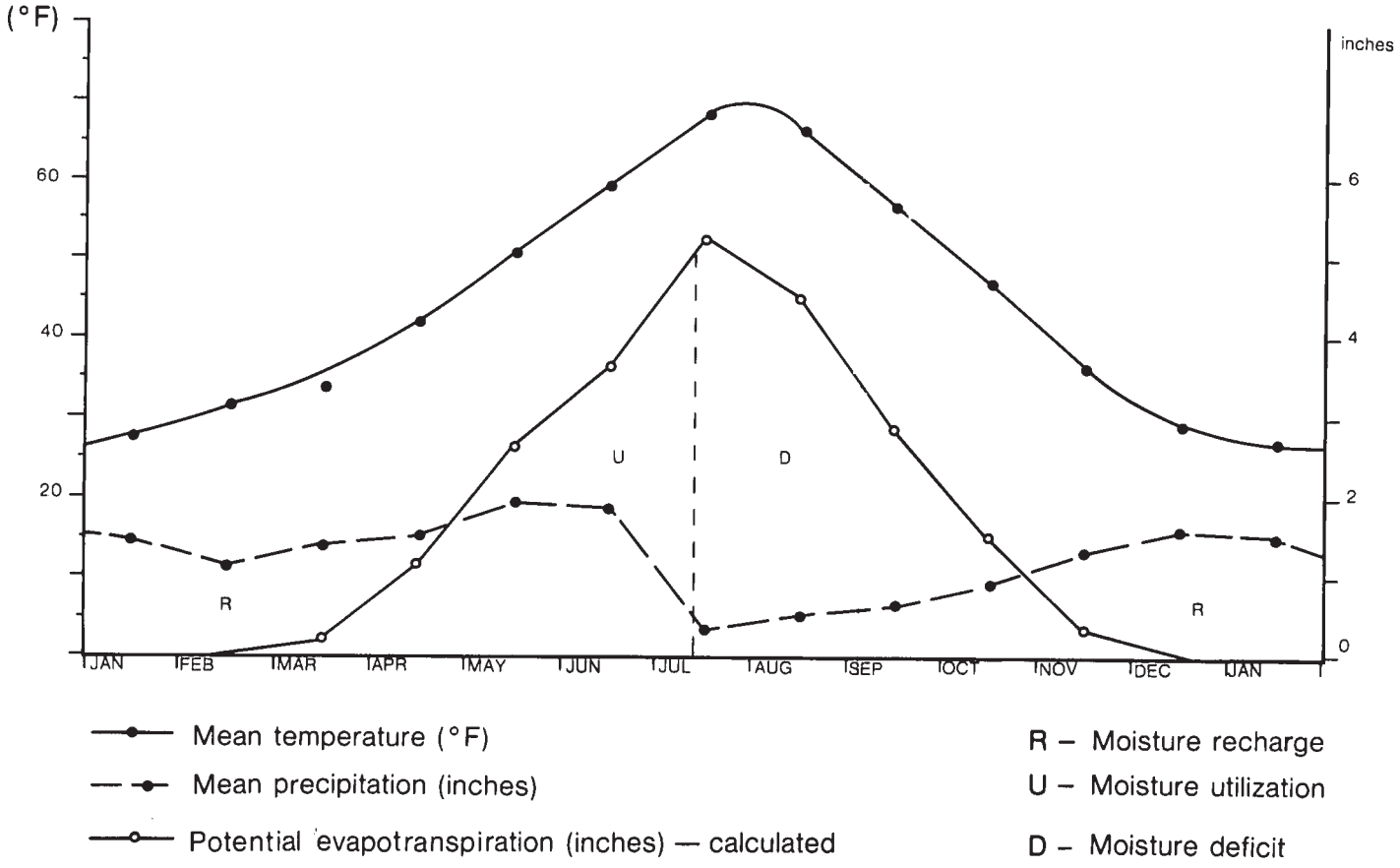


Figure 4.—Climatic data and soil-water balance. Data recorded at Owyhee, Nevada, during the period 1951-71.

The soil-forming factors of parent material, biological forces, relief, and time are discussed in the following paragraphs according to geomorphic positions.

Flood plains.—Wide, nearly level flood plains are along the Owyhee River and Blue Creek. These flood plains formed in geologically recent time as streams cut into the surrounding high terraces (*4*). As erosion decreased, these areas were subsequently partially filled with flood-deposited alluvium, which has accumulated gradually up to the present time. The alluvium consists of highly stratified sediment that exhibits a wide range of texture and mineralogy. Typical soils that formed in this material are the Hayspur soils, Fluvaquentic Haplaquolls, and the Zola soils, Cumulic Haploxerolls. These soils are weakly developed and are characterized by strata of different textures, soil colors associated with wetness, and surface horizons that have a high content of organic matter, partly as a result of deposition.

The mode of deposition of the flood-borne sediment influences the textures of the soil material. On the main flood plain of the Owyhee River, the higher velocity of the floodwater has resulted in the deposition of loamy soils. In the Blue Creek area, the floodwater has less velocity and ponds on the soils for longer periods of time. Consequently, the soils in this area are clayey in the upper part of the profile and have only a small amount of sand.

The low-lying positions and nearly level slopes of the soils on the flood plains generally result in poor drainage. High ground water levels and, in many places, frequent flooding have resulted in grayish soil colors, which is indicative of reduced iron. Rust-colored mottles are common.

The poorly drained soils formed under water-loving grasses, sedges, and forbs. The surface layer of these soils generally is very high in content of organic matter (as much as 12 percent). Many soils have a dark-colored, very thick A horizon because of the decomposition of the abundant plant roots and leaves and because of the addition of sediment containing organic matter. A buried A horizon is common.

Because these flood plain soils are young, the subsoil typically is weakly developed. Most of the soils do not have a cambic horizon. A few soils formed in material

with appreciable quantities of sodium that has promoted the movement of clay into the subsoil and the formation of a natric horizon. The Bluecreek Variant soils, Typic Natrixeralfs, are an example.

Soils that have a clayey solum that is subject to high shrink-swell potential develop deep, wide, vertical cracks when they dry in summer. The Boulder Lake soils, Aquic Chromoxererts, are an example. When these soils are moistened in winter, the clay swells and the cracks close. The annual cycle of cracking and swelling tends to churn and mix the upper layers of the profile down to the average depth of cracking, which inhibits any marked horizonation in the soils. These layers are dark colored throughout because of the mixing of organic matter.

Alluvial terraces.—Alluvial terraces are between the foothills and mountains and the flood plains in the central part of the survey area. The terraces consist of old alluvium deposited during the Pleistocene (*4*). The higher terraces are considered to be early Pleistocene in age, which is supported by the strongly expressed horizons in many of the soils.

During the Pleistocene the valley accumulated sediment that was eroded from the surrounding uplands, predominantly from the hills and mountains to the south. The alluvium commonly is sandy and gravelly and is derived from rock of mixed lithology. The gravel is dominantly rhyolite, chert, tuff, and quartzite. Loamy alluvium was deposited over this coarse textured stratum. In some places loess has been added to the soils. The Soonahbe soils are an example.

Later in the Pleistocene, the ancient Owyhee River cut into the older alluvium and formed an intermediate terrace. A good example of a remnant of this surface is at the southern end of the narrow bench between Thacker Slough and the Owyhee River.

The soils on these old surfaces show the effects of water moving into the profile during the Holocene and during part of the Pleistocene. Sufficient time has passed for an argillic horizon to form in all the soils and for a duripan to form in the soils on the oldest positions, such as in the Thacker soils, Abruptic Durixeralfs. The Simonton soils, Ultic Argixerolls, have been substantially leached of bases, which was facilitated by their coarse texture and acid parent material.

The native sagebrush-grass vegetation, with its deep fibrous root systems, has added appreciable amounts of organic matter to the surface layer of the Paynecreek and Simonton soils, which are Xerolls. The Soonahbe, Bluecreek, and Thacker soils, which are Xeralfs, also formed under sagebrush and grass, but they have not accumulated as much organic matter even though the production of vegetation is similar. A mollic epipedon, which is evidence of the accumulation of organic matter, seems to be associated with the degree of profile development and perhaps the age of the soil. Organic matter tends to be more abundant in soils that are not strongly leached in the surface layer. In general, the Xerolls have a less developed profile than the Xeralfs; they do not have a duripan and a strongly expressed argillic horizon, and they typically have higher base saturation in the surface layer. Perhaps the lower base saturation of the Xeralfs has allowed more clay to become dispersed and consequently is more subject to eluviation. Under the soil-forming conditions in this survey area, Xeralfs may be the ultimate level of soil formation.

Animals have noticeably influenced the profile of the Soonahbe soils. Backfilled badger burrows are common krotovinas immediately above the duripan. Hard nodules formed by cicadas are common in the subsoil.

Basalt and rhyolite tablelands.—Tablelands are on the northeastern and western sides of Duck Valley. They are composed dominantly of Miocene basalt, but a small area of Miocene rhyolite is east of Hat Peak (*3, 4*). Tablelands are extensively broken and tilted by generally north-south trending faults. The faulting has produced a topography characterized by elevated, flat-topped tables with abrupt side slopes and intervening drainage basins (fig. 5).

The parent material on the stable land surfaces is thought to be very old alluvial and eolian material influenced by more recent loess. This material is highly weathered, making its specific origin obscure. The subsoil typically is 50 to 80 percent clay. The age of this material is thought to be early Pleistocene. Soils that are shallow to bedrock formed in material perhaps influenced by residuum. Parent material in the drainage basins is alluvium eroded from the surrounding tablelands.

The western tablelands show striking evidence of modification of the original parent material by periglacial processes. These are processes associated with the local Ice Age environment. Frost churning has created an extensive and regular pattern of mounds on the stable land surfaces. In the gently sloping areas, the mounds are surrounded by stone polygons of Rubble land (*5*).

The soils of the tablelands are very strongly developed, primarily as a result of their long period of soil formation and the stability of the land surface. A pronounced clayey argillic horizon is typical, even in the younger drainage basins. The argillic horizon commonly exhibits an abrupt upper boundary. The horizon immediately above the argillic horizon shows evidence of intense leaching, including uncoated silt grains, or skeletans, on ped faces and light colors. The soils of the Deunah series, Abruptic Durixeralfs, are representative of well developed soils.

Some soils have a clayey argillic horizon that has a deeper and more gradual upper boundary and a darker color at the surface. The Hatpeak soils, Typic Durixerolls, are an example. More organic matter has accumulated in the surface layer, possibly because of the less intensive leaching as a result of percolating water not

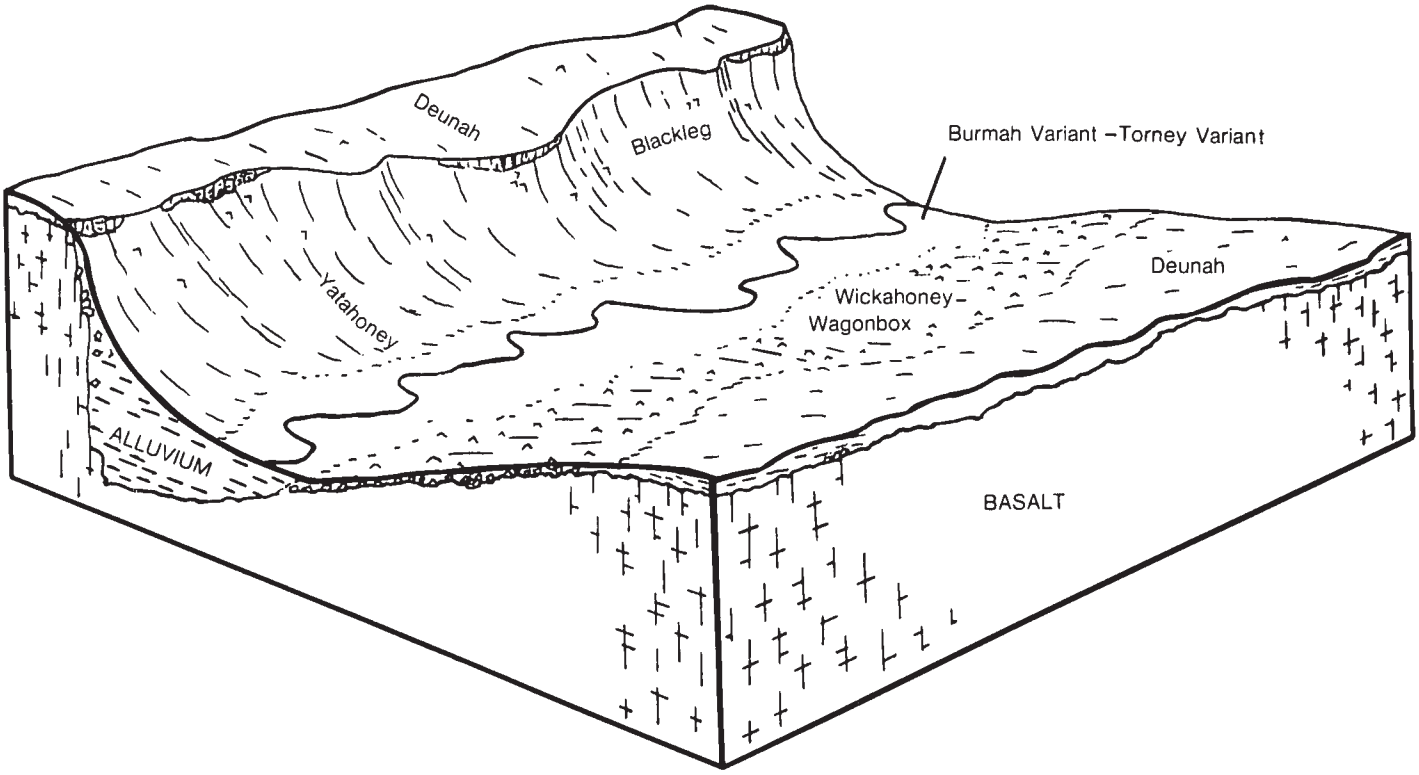


Figure 5.—Typical landscape of basalt tableland in western part of survey area.

concentrating above a shallow abrupt argillic horizon, as is common in Xeralfs.

Many soils of the tablelands have a duripan. The pan typically has high chroma and a noneffervescent matrix with coatings of silica and manganese oxide. Seams or filaments of secondary carbonates are common in the pan. This suggests that the carbonates have been leached into a pan that had formed previously in a noncalcareous environment.

Hills and mountains.—Hills and mountains are in the southeastern part of the survey area. They are composed of rhyolite and rhyolitic tuff, granite, sandstone, and siltstone of various ages (*3*). Slopes generally are steep; relief is 800 to 1,800 feet. The landscape is extensively dissected by creeks and intermittent drainageways.

Parent material has a more distinctive effect on soil formation on these landscape positions than in other parts of the survey area. The soils on the steeper slopes formed in colluvium. This material weathered from the bedrock and has been moved slowly downslope by gravity and by water erosion. It typically contains angular rock fragments of all sizes. The mineralogy and texture of the colluvium is directly related to the rock from which it weathered.

The soils that developed in colluvium derived from calcareous sedimentary rock typically have a horizon of secondary carbonate accumulation. The Searla soils, Calcic Argixerolls, are an example. Colluvium derived from granite tends to have a high content of coarse sand and is low in base saturation. The Moonstone soils, Pachic Ultic Haploxerolls, have these properties. Colluvium derived from acid volcanic rock tends to produce soils with a high clay content and low base saturation. The Cavanaugh soils, Ultic Argixerolls, are an example.

The higher precipitation in the mountainous areas has produced more vegetation; consequently, the soils in these areas contain more organic matter and are darker colored than are those at lower elevations. In addition, cool temperatures also promote the accumulation of organic matter by inhibiting microbial activity, as in the Parkay soils, which are Argic Pachic Cryoborolls.

The steep slopes and currently eroding surfaces have kept the soils relatively young; however, most of the soils are old and stable enough to have formed an argillic horizon. With the exception of the Cavanaugh soils, however, they do not have a strong argillic horizon. A duripan, which is so prevalent in the more stable, less sloping soils, is not present in the soils on hills and mountains.

References

(1) American Association of State Highway [and Transportation] Officials. 1970. Standard specifications for highway materials and methods of sampling and testing. Ed. 10, 2 vol., illus.

(2) American Society for Testing and Materials. 1974. Method for classification of soils for engineering purposes. ASTM Stand. D 2487-69. *In* 1974 Annual Book of ASTM Standards, Part 19, 464 pp., illus.

(3) Coats, Robert R. 1971. Geologic map of the Owyhee Quadrangle Nevada-Idaho. U.S. Geol. Surv. Misc. Invest. Map I-665, 2 sheets.

(4) Ekren, E. B., D. H. McIntyre, E. H. Bennett, and H. E. Malde. 1981. Geologic map of Owyhee County, Idaho, west of longitude 116° W. U.S. Geol. Surv. Misc. Invest. Map I-1256, 2 sheets.

(5) Hawley, J. W., and R. B. Parsons. 1980. Glossary of selected geomorphic and geologic terms. Soil Conserv. Serv., U.S. Dep. Agric., 30 pp.

(6) Palmer, W. C., and A. V. Havens. 1958. A graphic technique for determining evapotranspiration by the Thornthwaite method. Monthly Weather Review, vol. 86, pp. 123-128.

(7) Rice, Kenneth A. 1971. Idaho climatological summary data by counties. National Weather Serv., 5 pp.

(8) United States Department of Agriculture. 1951. Soil survey manual. U.S. Dep. Agric. Handb. 18, 503 pp., illus. [Supplements replacing pp. 173–188 issued May 1962]

(9) United States Department of Agriculture. 1975. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. Soil Conserv. Serv., U.S. Dep. Agric. Handb. 436, 754 pp., illus.

(10) Wilsie, Carroll P. 1962. Crop adaptation and distribution. W. H. Freeman and Co., San Francisco and London. 448 pp., illus.

Glossary

Aeration, soil. The exchange of air in soil with air from the atmosphere. The air in a well aerated soil is similar to that in the atmosphere; the air in a poorly aerated soil is considerably higher in carbon dioxide and lower in oxygen.

Alluvium. Material, such as sand, silt, or clay, deposited on land by streams.

Area reclaim (in tables). An area difficult to reclaim after the removal of soil for construction and other uses. Revegetation and erosion control are extremely difficult.

Association, soil. A group of soils or miscellaneous areas geographically associated in a characteristic repeating pattern and defined and delineated as a single map unit.

Available water capacity (available moisture capacity). The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 60-inch profile or to a limiting layer is expressed as—

	Inches
Very low	0 to 2.5
Low	2.5 to 3.75
Moderate	3.75 to 5.0
High	5.0 to 7.5
Very high	More than 7.5

Base saturation. The degree to which material having cation exchange properties is saturated with exchangeable bases (sum of Ca, Mg, Na, K), expressed as a percentage of the total cation exchange capacity.

Bedrock. The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.

Bottom land. The normal flood plain of a stream, subject to flooding.

Boulders. Rock fragments larger than 2 feet (60 centimeters) in diameter.

Calcareous soil. A soil containing enough calcium carbonate (commonly combined with magnesium carbonate) to effervesce visibly when treated with cold, dilute hydrochloric acid.

Chiseling. Tillage with an implement having one or more soil-penetrating points that loosen the subsoil and bring clods to the surface. A form of emergency tillage to control soil blowing.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter, in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Clay film. A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels. Synonyms: clay coating, clay skin.

Claypan. A slowly permeable soil horizon that contains much more clay than the horizons above it. A claypan is commonly hard when dry and plastic or stiff when wet. It substantially restricts root growth and water and air movement. Claypans are usually very strongly developed argillic horizons.

Climax plant community. The plant community on a given site that will be established if present environmental conditions continue to prevail and the site is properly managed.

Coarse fragments. Mineral or rock particles larger than 2 millimeters in diameter.

Coarse textured soil. Sand or loamy sand.

Cobble (or cobblestone). A rounded or partly rounded fragment of rock 3 to 10 inches (7.6 to 25 centimeters) in diameter.

Colluvium. Soil material, rock fragments, or both, moved by creep, slide, or local wash and deposited at the base of steep slopes.

Complex, soil. A map unit of two or more kinds of soil or miscellaneous areas in such an intricate pattern or so small in area that it is not practical to map them separately at the selected scale of mapping. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas.

Compressible (in tables). Excessive decrease in volume of soft soil under load.

Concretions. Grains, pellets, or nodules of various sizes, shapes, and colors consisting of concentrated compounds or cemented soil grains. The composition of most concretions is unlike that of the surrounding soil. Calcium carbonate and iron oxide are common compounds in concretions.

Consistence, soil. The feel of the soil and the ease with which a lump can be crushed by the fingers. Terms commonly used to describe consistence are—

Loose.—Noncoherent when dry or moist; does not hold together in a mass.
Friable.—When moist, crushes easily under gentle pressure between thumb and forefinger and can be pressed together into a lump.
Firm.—When moist, crushes under moderate pressure between thumb and forefinger, but resistance is distinctly noticeable.
Plastic.—Readily deformed by moderate pressure but can be pressed into a lump; will form a "wire" when rolled between thumb and forefinger.
Sticky.—Adheres to other material and tends to stretch somewhat and pull apart rather than to pull free from other material.
Hard.—When dry, moderately resistant to pressure; can be broken with difficulty between thumb and forefinger.
Soft.—When dry breaks into powder or individual grains under very slight pressure.
Cemented.—Hard; little affected by moistening.

Control section. The part of the soil on which classification is based. The thickness varies among different kinds of soil, but for many it is that part of the soil profile between depths of 10 inches and 40 or 80 inches.

Cutbanks cave (in tables). The walls of excavations tend to cave in or slough.

Decreasers. The most heavily grazed climax range plants. Because they are the most palatable, they are the first to be destroyed by overgrazing.

Deferred grazing. Postponing grazing or arresting grazing for a prescribed period.

Dense layer (in tables). A very firm, massive layer that has a bulk density of more than 1.8 grams per cubic centimeter. Such a layer affects the ease of digging and can affect filling and compacting.

Depth to rock (in tables). Bedrock is too near the surface for the specified use.

Drainage class (natural). Refers to the frequency and duration of periods of saturation or partial saturation during soil formation, as opposed to altered drainage, which is commonly the result of artificial drainage or irrigation but may be caused by the sudden deepening of channels or the blocking of drainage outlets. Seven classes of natural soil drainage are recognized:
Excessively drained.—These soils have very high and high hydraulic conductivity and low water holding capacity. They are not suited for crop production unless irrigated.
Somewhat excessively drained.—These soils have high hydraulic conductivity and low water holding capacity. Without irrigation only a narrow range of crops can be grown, and yields are low.
Well drained.—These soils have intermediate water holding capacity. They retain optimum amounts of moisture, but they are not wet close enough to the surface or long enough during the growing season to adversely affect yields.
Moderately well drained.—These soils are wet close enough to the surface for long enough that planting or harvesting operations or yields of some field crops are adversely affected unless artificial drainage is provided. Moderately well drained soils commonly have a layer with low hydraulic conductivity, a wet layer relatively high in the profile, additions of water by seepage, or some combination of these.
Somewhat poorly drained.—These soils are wet close enough to the surface or long enough that planting or harvesting operations or crop growth is markedly restricted unless artificial drainage is provided. Somewhat poorly drained soils commonly have a layer with low hydraulic conductivity, a wet layer high in the profile, additions of water through seepage, or a combination of these.
Poorly drained.—These soils commonly are so wet at or near the surface during a considerable part of the year that field crops cannot be grown under natural conditions. Poorly drained conditions are caused by a saturated zone, a layer with low hydraulic conductivity, seepage, or a combination of these.
Very poorly drained.—These soils are wet to the surface most of the time. These soils are wet enough to prevent the growth of important crops (except rice) unless artificially drained.

Drainage, surface. Runoff, or surface flow of water, from an area.

Duripan. A continuous strongly silica-cemented or indurated layer in the soil that severely restricts root and water penetration.

Eolian soil material. Earthy parent material accumulated through wind action; commonly refers to sandy material in dunes or to loess in blankets on the surface.

Erosion. The wearing away of the land surface by water, wind, ice, or other geologic agents and by such processes as gravitational creep.
Erosion (geologic). Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion.
Erosion (accelerated). Erosion much more rapid than geologic erosion, mainly as a result of the activities of man or other animals or of a catastrophe in nature; for example, fire that exposes the surface.

Excess alkali (in tables). Excess exchangeable sodium in the soil. The resulting poor physical properties restrict the growth of plants.

Excess fines (in tables). Excess silt and clay in the soil. The soil does not provide a source of gravel or sand for construction purposes.

Excess lime (in tables). Excess carbonates in the soil that restrict the growth of some plants.

Excess salts (in tables). Excess water-soluble salts in the soil that restrict the growth of most plants.

Fast intake (in tables). The rapid movement of water into the soil.

Fertility, soil. The quality that enables a soil to provide plant nutrients, in adequate amounts and in proper balance, for the growth of specified plants when light, moisture, temperature, tilth, and other growth factors are favorable.

Fine textured soil. Sandy clay, silty clay, and clay.

Flood plain. A nearly level alluvial plain that borders a stream and is subject to flooding unless protected artificially.

Foot slope. The inclined surface at the base of a hill.

Forb. Any herbaceous plant not a grass or a sedge.

Fragile (in tables). A soil that is easily damaged by use or disturbance.

Gleyed soil. Soil that formed under poor drainage, resulting in the reduction of iron and other elements in the profile and in gray colors and mottles.

Grassed waterway. A natural or constructed waterway, typically broad and shallow, seeded to grass as protection against erosion. Conducts surface water away from cropland.

Gravel. Rounded or angular fragments of rock as much as 3 inches (2 millimeters to 7.6 centimeters) in diameter. An individual piece is a pebble.

Gravelly soil material. Material that is 15 to 50 percent, by volume, rounded or angular rock fragments, not prominently flattened, as much as 3 inches (7.6 centimeters) in diameter.

Ground water (geology). Water filling all the unblocked pores of underlying material below the water table.

Hardpan. A hardened or cemented soil horizon, or layer. The soil material is sandy, loamy, or clayey and is cemented by iron oxide, silica, calcium carbonate, or other substance.

Horizon, soil. A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. In the identification of soil horizons, an upper case letter represents the major horizons. Numbers or lower case letters that follow represent subdivisions of the major horizons. An explanation of the subdivisions is given in the *Soil Survey Manual*. The major horizons of mineral soil are as follows:

O horizon.—An organic layer of fresh and decaying plant residue.

A horizon.—The mineral horizon at or near the surface in which an accumulation of humified organic matter is mixed with the mineral material. Also, a plowed surface horizon, most of which was originally part of a B horizon.

B horizon.—The mineral horizon below an A or E horizon. The B horizon is in part a layer of transition from the overlying A to the underlying C horizon. The B horizon also has distinctive characteristics such as (1) accumulation of clay, sesquioxides, silica, carbonates, humus, or a combination of these; (2) prismatic or blocky structure; (3) redder or browner colors than those in the A horizon; or (4) a combination of these.

E horizon.—The mineral horizon in which the main feature is loss of silicate clay, iron, alluminum, or some combination of these.

C horizon.—The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the overlying soil material. The material of a C horizon may be either like or unlike that in which the solum formed. If the material is known to differ from that in the solum, the number 2 precedes the letter C.

R layer.—Consolidated rock beneath the soil. The rock commonly underlies a C horizon, but can be directly below an A or a B horizon.

Hydrologic soil groups. Refers to soils grouped according to their runoff-producing characteristics. The chief consideration is the inherent capacity of soil bare of vegetation to permit infiltration. The slope and the kind of plant cover are not considered but are separate factors in predicting runoff. Soils are assigned to four groups. In group A are soils having a high infiltration rate when thoroughly wet and having a low runoff potential. They are mainly deep, well drained, and sandy or gravelly. In group D, at the other extreme, are soils having a very slow infiltration rate and thus a high runoff potential. They have a claypan or clay layer at or near the surface, have a permanent high water table, or are shallow over nearly impervious bedrock or other material. A soil is assigned to two hydrologic groups if part of the acreage is artificially drained and part is undrained.

Igneous rock. Rock formed by solidification from a molten or partially molten state. Major varieties include plutonic and volcanic rock. Examples are andesite, basalt, and granite.

Increasers. Species in the climax vegetation that increase in amount as the more desirable plants are reduced by close grazing. Increasers commonly are the shorter plants and the less palatable to livestock.

Irrigation. Application of water to soils to assist in production of crops. Methods of irrigation are—

Border.—Water is applied at the upper end of a strip in which the lateral flow of water is controlled by small earth ridges called border dikes, or borders.

Basin.—Water is applied rapidly to nearly level plains surrounded by levees or dikes.
Controlled flooding.—Water is released at intervals from closely spaced field ditches and distributed uniformly over the field.
Corrugation.—Water is applied to small, closely spaced furrows or ditches in fields of close-growing crops or in orchards so that it flows in only one direction.
Drip (or trickle).—Water is applied slowly and under low pressure to the surface of the soil or into the soil through such applicators as emitters, porous tubing, or perforated pipe.
Furrow.—Water is applied in small ditches made by cultivation implements. Furrows are used for tree and row crops.
Sprinkler.—Water is sprayed over the soil surface through pipes or nozzles from a pressure system.
Subirrigation.—Water is applied in open ditches or tile lines until the water table is raised enough to wet the soil.
Wild flooding.—Water, released at high points, is allowed to flow onto an area without controlled distribution.

Lacustrine deposit (geology). Material deposited in lake water and exposed when the water level is lowered or the elevation of the land is raised.

Large stones (in tables). Rock fragments 3 inches (7.5 centimeters) or more across. Large stones adversely affect the specified use of the soil.

Leaching. The removal of soluble material from soil or other material by percolating water.

Liquid limit. The moisture content at which the soil passes from a plastic to a liquid state.

Loam. Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

Loess. Fine grained material, dominantly of silt-sized particles, deposited by wind.

Medium textured soil. Very fine sandy loam, loam, silt loam, or silt.

Minimum tillage. Only the tillage essential to crop production and prevention of soil damage.

Miscellaneous area. An area that has little or no natural soil and supports little or no vegetation.

Moderately coarse textured soil. Coarse sandy loam, sandy loam, and fine sandy loam.

Moderately fine textured soil. Clay loam, sandy clay loam, and silty clay loam.

Mottling, soil. Irregular spots of different colors that vary in number and size. Mottling generally indicates poor aeration and impeded drainage. Descriptive terms are as follows: abundance—*few, common,* and *many*; size—*fine, medium,* and *coarse*; and contrast—*faint, distinct,* and *prominent*. The size measurements are of the diameter along the greatest dimension. *Fine* indicates less than 5 millimeters (about 0.2 inch); *medium*, from 5 to 15 millimeters (about 0.2 to 0.6 inch); and *coarse*, more than 15 millimeters (about 0.6 inch).

Munsell notation. A designation of color by degrees of the three simple variables—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color of 10YR hue, value of 6, and chroma of 4.

Neutral soil. A soil having a pH value between 6.6 and 7.3. (See Reaction, soil.)

Organic matter. Plant and animal residue in the soil in various stages of decomposition.

Pan. A compact, dense layer in a soil that impedes the movement of water and the growth of roots. For example, *hardpan, fragipan, claypan, plowpan,* and *traffic pan*.

Parent material. The unconsolidated organic and mineral material in which soil forms.

Ped. An individual natural soil aggregate, such as a granule, a prism, or a block.

Pedon. The smallest volume that can be called "a soil." A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

Percs slowly (in tables). The slow movement of water through the soil adversely affecting the specified use.

Permeability. The quality of the soil that enables water to move downward through the profile. Permeability is measured as the number of inches per hour that water moves downward through the saturated soil. Terms describing permeability are:

Very slow	less than 0.06 inch
Slow	0.06 to 0.2 inch
Moderately slow	0.2 to 0.6 inch
Moderate	0.6 inch to 2.0 inches
Moderately rapid	2.0 to 6.0 inches
Rapid	6.0 to 20 inches
Very rapid	more than 20 inches

Phase, soil. A subdivision of a soil series based on features that affect its use and management. For example, slope, stoniness, and thickness.

pH value. A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)

Piedmont slope. The dominant gentle slope at the foot of a mountain including both individual and coalesced alluvial fans.

Piping (in tables). Formation of subsurface tunnels or pipelike cavities by water moving through the soil.

Plasticity index. The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

Plastic limit. The moisture content at which a soil changes from semisolid to plastic.

Plowpan. A compacted layer formed in the soil directly below the plowed layer.

Ponding. Standing water on soils in closed depressions. The water can be removed only by percolation or evapotranspiration.

Poor filter (in tables). Because of rapid permeability or an impermeable layer near the surface, the soil may not adequately filter effluent from a waste disposal system.

Poor outlets (in tables). Refers to areas where surface or subsurface drainage outlets are difficult or expensive to install.

Profile, soil. A vertical section of the soil extending through all its horizons and into the parent material.

Rangeland. Land on which the potential natural vegetation is predominantly grasses, grasslike plants, forbs, or shrubs suitable for grazing or browsing. It includes natural grasslands, savannas, many wetlands, some deserts, tundras, and areas that support certain forb and shrub communities.

Range condition. The present composition of the plant community on a range site in relation to the potential natural plant community for that site. Range condition is expressed as excellent, good, fair, or poor on the basis of how much the present plant community has departed from the potential.

Range site. An area of rangeland where climate, soil, and relief are sufficiently uniform to produce a distinct natural plant community. A range site is the product of all the environmental factors responsible for its development. It is typified by an association of species that differ from those on other range sites in kind or proportion of species or total production.

Reaction, soil. A measure of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degree of acidity or alkalinity is expressed as—

	pH
Extremely acid	Below 4.5
Very strongly acid	4.5 to 5.0
Strongly acid	5.1 to 5.5
Medium acid	5.6 to 6.0
Slightly acid	6.1 to 6.5
Neutral	6.6 to 7.3
Mildly alkaline	7.4 to 7.8
Moderately alkaline	7.9 to 8.4
Strongly alkaline	8.5 to 9.0
Very strongly alkaline	9.1 and higher

Relief. The elevations or inequalities of a land surface, considered collectively.

Residuum (residual soil material). Unconsolidated, weathered, or partly weathered mineral material that accumulated as consolidated rock disintegrated in place.

Rock fragments. Rock or mineral fragments having a diameter of 2 millimeters or more; for example, pebbles, cobbles, stones, and boulders.

Root zone. The part of the soil that can be penetrated by plant roots.

Rubble land. Land that is essentially covered with stones. So little soil material is between the stones that few plants can grow.

Rubbly. A soil textural modifier used to designate areas where stones appear to be nearly continuous and cover more than 50 percent of the surface. The distances between fragments are generally less than 12 inches.

Runoff. The precipitation discharged into stream channels from an area. The water that flows off the surface of the land without sinking into the soil is called surface runoff. Water that enters the soil before reaching surface streams is called ground-water runoff or seepage flow from ground water.

Sand. As a soil separate, individual rock or mineral fragments from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.

Sandstone. Sedimentary rock containing dominantly sand-size particles.

Sedimentary rock. Rock made up of particles deposited from suspension in water. The chief kinds of sedimentary rock are conglomerate, formed from gravel; sandstone, formed from sand; shale, formed from clay; and limestone, formed from soft masses of calcium carbonate. There are many intermediate types. Some wind-deposited sand is consolidated into sandstone.

Seepage (in tables). The movement of water through the soil. Seepage adversely affects the specified use.

Series, soil. A group of soils that have profiles that are almost alike, except for differences in texture of the surface layer or of the underlying material. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.

Shale. Sedimentary rock formed by the hardening of a clay deposit.

Shrink-swell (in tables). The shrinking of soil when dry and the swelling when wet. Shrinking and swelling can damage roads, dams, building foundations, and other structures. It can also damage plant roots.

Silica. A combination of silicon and oxygen. The mineral form is called quartz.

Silt. As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.

Slickensides. Polished and grooved surfaces produced by one mass sliding past another. In soils, slickensides may occur at the bases of slip surfaces on the steeper slopes; on faces of blocks, prisms, and columns; and in swelling clayey soils, where there is marked change in moisture content.

Slippage (in tables). Soil mass susceptible to movement downslope when loaded, excavated, or wet.

Slope. The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance.

Slope (in tables). Slope is great enough that special practices are required to insure satisfactory performance of the soil for a specific use.

Slope alluvium. Sediment that is gradually transported on mountainsides or hill slopes mainly by alluvial processes.

Slow intake (in tables). The slow movement of water is characterized by particle sorting into the soil.

Slow refill (in tables). The slow filling of ponds, resulting from restricted permeability in the soil.

Small stones (in tables). Rock fragments less than 3 inches (7.5 centimeters) in diameter. Small stones adversely affect the specified use of the soil.

Soil. A natural, three-dimensional body at the earth's surface. It is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time.

Soil separates. Mineral particles less than 2 millimeters in equivalent diameter and ranging between specified size limits. The names and sizes of separates recognized in the United States are as follows:

	Millimeters
Very coarse sand	2.0 to 1.0
Coarse sand	1.0 to 0.5
Medium sand	0.5 to 0.25
Fine sand	0.25 to 0.10
Very fine sand	0.10 to 0.05
Silt	0.05 to 0.002
Clay	less than 0.002

Solum. The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in soil consists of the A, E, and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the underlying material. The living roots and plant and animal activities are largely confined to the solum.

Stones. Rock fragments 10 to 24 inches (25 to 60 centimeters) in diameter if rounded or 6 to 15 inches (15 to 38 centimeters) in length if flat.

Stony. Refers to a soil containing stones in numbers that interfere with or prevent tillage.

Structure, soil. The arrangement of primary soil particles into compound particles or aggregates. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular*. *Structureless* soils are either *single grained* (each grain by itself, as in dune sand) or *massive* (the particles adhering without any regular cleavage, as in many hardpans).

Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.

Subsoiling. Tilling a soil below normal plow depth, ordinarily to shatter a hardpan or claypan.

Substratum. The part of the soil below the solum.

Subsurface layer. Technically, the E horizon. generally refers to a leached horizon lighter in color and lower in content of organic matter than the overlying surface layer.

Surface layer. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from 4 to 10 inches (10 to 25 centimeters). Frequently designated as the "plow layer," or the "Ap horizon."

Taxadjuncts. Soils that cannot be classified in a series recognized in the classification system. Such soils are named for a series they strongly resemble and are designated as taxadjuncts to that series because they differ in ways too small to be of consequence in interpreting their use and behavior.

Terrace (geologic). An old alluvial plain, ordinarily flat or undulating, bordering a river, a lake, or the sea.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay,* and *clay*. The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine."

Tillage pan. A compacted layer formed in the soil directly below the plowed layer.

Tilth, soil. The physical condition of the soil as related to tillage, seedbed preparation, seedling emergence, and root penetration.

Toe slope. The outermost inclined surface at the base of a hill; part of a foot slope.

Too arid (in tables). The soil is dry most of the time, and vegetation is difficult to establish.

Topsoil. The upper part of the soil, which is the most favorable material for plant growth. It is ordinarily rich in organic matter and is used to topdress roadbanks, lawns, and land affected by mining.

Toxicity (in tables). Excessive amount of toxic substances, such as sodium or sulfur, that severely hinder establishment of vegetation or severely restrict plant growth.

Trace elements. Chemical elements, for example, zinc, cobalt, manganese, copper, and iron, are in soils in extremely small amounts. They are essential to plant growth.

Tuff. A compacted deposit that is 50 percent or more volcanic ash and dust.

Unstable fill (in tables). Risk of caving or sloughing on banks of fill material.

Upland (geology). Land at a higher elevation, in general, than the alluvial plain or stream terrace; land above the lowlands along streams.

Valley fill. In glaciated regions, material deposited in stream valleys by glacial melt water. In nonglaciated regions, alluvium deposited by heavily loaded streams.

Variant, soil. A soil having properties sufficiently different from those of other known soils to justify a new series name, but occurring in such a limited geographic area that creation of a new series is not justified.

Variegation. Refers to patterns of contrasting colors assumed to be inherited from the parent material rather than to be the result of poor drainage.

Varve. A sedimentary layer or a lamina or sequence of laminae deposited in a body of still water within a year. Specifically, a thin pair of graded glaciolacustrine layers seasonally deposited, usually by melt water streams, in a glacial lake or other body of still water in front of a glacier.

Water bars. Smooth, shallow ditches or depressional areas that are excavated at an angle across a sloping road. They are used to reduce the downward velocity of water and divert it off and away from the road surface. Water bars can easily be driven over if constructed properly.

Weathering. All physical and chemical changes produced in rocks or other deposits at or near the earth's surface by atmospheric agents. These changes result in disintegration and decomposition of the material.

Well graded. Refers to soil material consisting of coarse grained particles that are well distributed over a wide range in size or diameter. Such soil normally can be easily increased in density and bearing properties by compaction. Contrasts with poorly graded soil.

Wilting point (or permanent wilting point). The moisture content of soil, on an ovendry basis, at which a plant (specifically sunflower) wilts so much that it does not recover when placed in a humid, dark chamber.

Windthrow. The action of uprooting and tipping over trees by the wind.

Tables

TABLE 1.--TEMPERATURE AND PRECIPITATION

[Recorded in the period 1951-80 at Owyhee, NV]

Month	Temperature						Precipitation				
	Average daily maximum	Average daily minimum	Average	2 years in 10 will have-- Maximum temperature higher than--	2 years in 10 will have-- Minimum temperature lower than--	Average number of growing degree days[1]	Average	2 years in 10 will have-- Less than--	2 years in 10 will have-- More than--	Average number of days with 0.10 inch or more	Average snowfall
	°F	°F	°F	°F	°F	Units	In	In	In		In
January----	36.9	17.6	27.3	57	-20	16	1.37	0.75	1.91	6	10.6
February---	41.9	22.8	32.4	62	-6	46	1.09	0.56	1.55	5	11.0
March------	45.7	23.4	34.6	67	0	43	1.41	0.80	1.95	5	11.4
April------	54.6	30.0	42.3	77	14	133	1.40	0.67	2.02	5	8.8
May--------	64.1	37.8	51.0	85	21	358	1.80	0.70	2.74	6	1.8
June-------	73.9	44.4	59.2	91	29	576	1.71	0.47	2.71	4	0.1
July-------	85.4	51.4	68.4	96	37	880	0.36	0.06	0.59	1	0.0
August-----	82.6	49.4	66.0	95	32	806	0.50	---	0.87	2	0.0
September--	74.8	41.0	57.9	91	22	537	0.73	0.14	1.19	2	0.0
October----	63.1	31.9	47.5	83	14	249	1.02	0.23	1.65	3	2.4
November---	48.4	25.4	36.9	70	2	55	1.19	0.40	1.84	4	5.0
December---	40.2	19.9	30.1	61	-12	25	1.41	0.62	2.08	6	10.9
Yearly:											
Average--	59.3	32.9	46.1	---	---	---	---	---	---	---	---
Extreme--	---	---	---	96	-20	---	---	---	---	---	---
Total----	---	---	---	---	---	3,724	13.99	11.34	16.70	49	62.0

[1] A growing degree day is a unit of heat available for plant growth. It can be calculated by adding the maximum and minimum daily temperatures, dividing the sum by 2, and subtracting the temperature below which growth is minimal for the principal crops in the area (40 °F).

TABLE 2.--FREEZE DATES IN SPRING AND FALL

[Recorded in the period 1951-80
at Owyhee, NV]

Probability	Temperature		
	24 °F or lower	28 °F or lower	32 °F or lower
Last freezing temperature in spring:			
1 year in 10 later than--	May 24	May 30	June 27
2 years in 10 later than--	May 18	May 25	June 20
5 years in 10 later than--	May 6	May 15	June 8
First freezing temperature in fall:			
1 year in 10 earlier than--	September 20	September 9	August 15
2 years in 10 earlier than--	September 26	September 14	August 24
5 years in 10 earlier than--	October 6	September 24	September 10

TABLE 3.--GROWING SEASON

[Recorded in the period 1951-80
at Owyhee, NV]

Probability	Length of growing season if daily minimum temperature exceeds--		
	24 °F	28 °F	32 °F
	Days	Days	Days
9 years in 10	127	108	63
8 years in 10	136	116	74
5 years in 10	153	131	93
2 years in 10	170	146	113
1 year in 10	179	154	123

TABLE 4.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS

Map symbol	Soil name	Owyhee Co., ID	Elko Co., NV	Total-- Area	Total-- Extent
		Acres	Acres	Acres	Pct
1	Bedstead-Arbidge association, 2 to 15 percent slopes	907	0	907	0.3
2	Blackfoot, frequently flooded-Tucker, gravelly substratum complex , 0 to 2 percent slopes	1,046	186	1,232	0.4
3	Bluecreek-Thacker dry complex, 1 to 4 percent slopes	1,295	0	1,295	0.4
4	Bluecreek Variant-Paynecreek Variant complex, 0 to 4 percent slopes	2,968	0	2,968	1.0
5	Boulder Lake-Tucker, gravelly substratum complex, 0 to 1 percent slopes	1,043	0	1,043	0.4
6	Bulake-Deunah complex, 2 to 25 percent slopes	0	8,442	8,442	2.9
7	Burmah Variant-Torney Variant-Yatahoney complex, 0 to 2 percent slopes	2,714	1,482	4,196	1.4
8	Cavanaugh-Obray association, 4 to 30 percent slopes	0	7,065	7,065	2.4
9	Cavanaugh-Sattley association, 15 to 40 percent slopes	0	17,984	17,984	6.2
10	Crooked Creek-Bear Lake complex, 0 to 2 percent slopes	4,853	295	5,148	1.8
11	Deunah stony silt loam, 1 to 4 percent slopes	13,598	5,932	19,530	6.7
12	Disabel Variant silt loam, 0 to 2 percent slopes	1,711	145	1,856	0.6
13	Disabel Variant-Bluecreek complex, 0 to 3 percent slopes	3,878	0	3,878	1.3
14	Dranyon-Strickland-Parkay association, 2 to 30 percent slopes	1,605	0	1,605	0.6
15	Haploxeralfs-Durixeralfs-Rubble land complex, 20 to 50 percent slopes	12,763	6,294	19,057	6.6
16	Hayspur clay loam, 0 to 2 percent slopes	510	1,216	1,726	0.6
17	Hayspur-Blackfoot complex, 0 to 2 percent slopes	0	3,061	3,061	1.1
18	Hayspur-Zola frequently flooded-Paynecreek complex, 0 to 4 percent slopes	0	1,969	1,969	0.7
19	Lasauses Variant-Boulder Lake association, 0 to 1 percent slopes	1,613	0	1,613	0.6
20	Moonstone-Earcree association, 20 to 45 percent slopes	0	4,348	4,348	1.5
21	Parkay-Dranyon-Cavanaugh complex, 15 to 50 percent slopes	0	8,381	8,381	2.9
22	Parkay-Wickahoney-Boulder Lake complex, 0 to 30 percent slopes	5,593	0	5,593	1.9
23	Paynecreek gravelly loam, 1 to 4 percent slopes	859	1,963	2,822	1.0
24	Paynecreek gravelly loam, 8 to 16 percent slopes	2,029	1,347	3,376	1.2
25	Paynecreek-Thacker dry complex, 4 to 10 percent slopes	1,146	1,558	2,704	0.9
26	Petan-Deunah-Hatpeak complex, 1 to 8 percent slopes	2,496	1,822	4,318	1.5
27	Rubble land-Deunah complex, 1 to 6 percent slopes	12,257	3,657	15,914	5.5
28	Rubble land-Rock outcrop-Argixerolls complex, 25 to 95 percent slopes	2,321	0	2,321	0.8
29	Searla-Povey association, 30 to 60 percent slopes	0	3,016	3,016	1.0
30	Simonton sandy loam, 1 to 3 percent slopes	643	0	643	0.2
31	Simonton-Bluecreek complex, 1 to 4 percent slopes	1,852	0	1,852	0.6
32	Simonton-Thacker dry complex, 1 to 4 percent slopes	2,804	0	2,804	1.0
33	Simonton-Thacker dry complex, 4 to 10 percent slopes	679	0	679	0.2
34	Soonahbe silt loam, 1 to 3 percent slopes	234	2,804	3,038	1.0
35	Soonahbe-Thacker dry complex, 1 to 4 percent slopes	2,255	10,933	13,188	4.6
36	Soonahbe Variant-Bulake complex, 2 to 15 percent slopes	0	4,339	4,339	1.5
37	Strickland-Bluebell complex, 2 to 20 percent slopes	7,752	8,815	16,567	5.7
38	Thacker loam, 1 to 4 percent slopes	956	2,186	3,142	1.1
39	Thacker very stony loam, 2 to 10 percent slopes	1,272	674	1,946	0.7
40	Thacker-Simonton complex, 1 to 4 percent slopes	1,343	1,181	2,524	0.9
41	Thacker-Simonton complex, 4 to 10 percent slopes	1,733	0	1,733	0.6
42	Thacker-Soonahbe complex, 4 to 10 percent slopes	1,318	3,719	5,037	1.7
43	Thacker-Yatahoney complex, 1 to 8 percent slopes	1,586	414	2,000	0.7
44	Tucker silty clay loam, 0 to 2 percent slopes	1,807	0	1,807	0.6
45	Tucker silty clay loam, gravelly substratum, 0 to 2 percent slopes	903	0	903	0.3
46	Tucker Variant silty clay loam, 0 to 2 percent slopes	745	0	745	0.3
47	Watchabob-Bearskin Variant complex, 10 to 40 percent slopes	0	2,362	2,362	0.8
48	Wickahoney stony loam, 2 to 20 percent slopes	0	3,363	3,363	1.2
49	Wickahoney-Blackleg association, 2 to 30 percent slopes	2,206	1,732	3,938	1.4
50	Wickahoney-Wagonbox complex, 2 to 8 percent slopes	29,333	6,185	35,518	12.3
51	Yatahoney-Blackleg complex, 4 to 20 percent slopes	3,806	7,342	11,148	3.8
52	Yatahoney-Soonahbe complex, 2 to 10 percent slopes	0	3,152	3,152	1.1
53	Zola loam, 0 to 2 percent slopes	1,123	3,329	4,452	1.5
54	Zola loam, frequently flooded, 0 to 2 percent slopes	1,047	0	1,047	0.4
55	Zola-Hayspur complex, channeled	1,119	858	1,977	0.7
	Water	1,824	723	2,547	0.9
	Total	145,545	144,274	289,819	100.0

TABLE 5.--YIELDS PER ACRE OF CROPS AND PASTURE

[Yields in the N columns are for nonirrigated soils; those in the I columns are for irrigated soils. Yields are those that can be expected under a high level of management. Absence of a yield indicates that the soil is not suited to the crop or the crop generally is not grown on the soil. Only the soils suited to crops and pasture are listed]

Soil name and map symbol	Alfalfa hay		Barley		Winter wheat		Pasture		Grass hay	
	N	I	N	I	N	I	N	I	N	I
	Tons	Tons	Bu	Bu	Bu	Bu	AUM*	AUM*	Tons	Tons
2---- Blackfoot-Tucker	---	---	---	---	---	---	---	10	---	4.0
3---- Bluecreek-Thacker	---	3.5	---	60	---	55	---	9	---	---
16---- Hayspur	---	---	---	---	---	---	---	9	---	3.5
17---- Hayspur-Blackfoot	---	---	---	---	---	---	---	9	---	3.7
18---- Hayspur-Zola-Paynecreek	---	---	---	---	---	---	---	11	---	---
23---- Paynecreek	---	5.0	---	80	30	75	---	12	---	---
24---- Paynecreek	---	4.5	---	70	20	65	---	11	---	---
25---- Paynecreek-Thacker	---	4.5	---	75	---	70	---	11	---	---
30---- Simonton	---	4.5	---	80	30	75	---	11	---	---
31---- Simonton-Bluecreek	---	4.0	---	73	---	68	---	10	---	---
32---- Simonton-Thacker	---	4.0	---	71	---	66	---	10	---	---
33---- Simonton-Thacker	---	4.0	---	70	---	66	---	10	---	---
34---- Soonahbe	---	5.0	---	80	30	75	---	12	---	---
35---- Soonahbe-Thacker	---	4.5	---	70	---	66	---	11	---	---
38---- Thacker	---	3.5	---	60	---	55	---	9	---	---
40---- Thacker-Simonton	---	4.0	---	68	---	63	---	10	---	---
41---- Thacker-Simonton	---	4.0	---	68	---	64	---	10	---	---
42---- Thacker-Soonahbe	---	4.0	---	68	---	63	---	10	---	---

See footnote at end of table.

TABLE 5.--YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Alfalfa hay		Barley		Winter wheat		Pasture		Grass hay	
	N	I	N	I	N	I	N	I	N	I
	Tons	Tons	Bu	Bu	Bu	Bu	AUM*	AUM*	Tons	Tons
44, 45---------- Tucker	---	---	---	---	---	---	---	10	---	4.0
53---------- Zola	---	5.0	---	80	30	75	---	12	---	---
54---------- Zola	---	5.0	---	80	30	75	---	12	---	---
55---------- Zola-Hayspur	---	---	---	---	---	---	---	11	---	---

* Animal-unit-month: The amount of forage or feed required to feed one animal unit (one cow, one horse, one mule, five sheep, or five goats) for 30 days.

TABLE 6.--RANGELAND PRODUCTIVITY AND CHARACTERISTIC PLANT COMMUNITIES

[Only the soils that support rangeland vegetation suitable for grazing are listed]

Soil name and map symbol	Range site	Total production		Characteristic vegetation	Composition
		Kind of year	Dry weight		
			Lb/acre		Pct
1*:					
Bedstead----------	Shallow-Claypan 12-16" Ppt Zone.	Favorable	950	Bluebunch wheatgrass----------	25
		Normal	600	Idaho fescue----------	20
		Unfavorable	350	Low sagebrush----------	20
				Thurber needlegrass----------	5
				Sandberg bluegrass----------	5
				Longleaf phlox----------	5
				Rabbitbrush----------	5
Arbidge----------	Loamy 10-13" Ppt Zone---------	Favorable	1,100	Bluebunch wheatgrass----------	35
		Normal	750	Wyoming big sagebrush---------	30
		Unfavorable	400	Thurber needlegrass----------	5
				Bottlebrush squirreltail------	5
				Sandberg bluegrass----------	5
				Arrowleaf balsamroot----------	5
3*:					
Bluecreek---------	Loamy 12-16" Ppt Zone---------	Favorable	1,300	Idaho fescue----------	25
		Normal	900	Basin big sagebrush----------	20
		Unfavorable	600	Bluebunch wheatgrass----------	15
				Nevada bluegrass----------	5
				Lupine----------	5
				Arrowleaf balsamroot----------	5
				Tapertip hawksbeard----------	5
				Antelope bitterbrush----------	5
Thacker----------	Loamy 12-16" Ppt Zone---------	Favorable	1,300	Idaho fescue----------	25
		Normal	1,000	Basin big sagebrush----------	20
		Unfavorable	600	Bluebunch wheatgrass----------	10
				Nevada bluegrass----------	5
				Arrowleaf balsamroot----------	5
				Tapertip hawksbeard----------	5
				Lupine----------	5
				Twistedleaf rabbitbrush-------	5
				Antelope bitterbrush----------	5
4*:					
Bluecreek Variant-	Clay Basin 12-16" Ppt Zone----	Favorable	1,100	Silver sagebrush----------	35
		Normal	850	Bluegrass----------	15
		Unfavorable	600	Slender wheatgrass----------	15
				Bottlebrush squirreltail------	5
				Northern barley----------	5
				Sedge----------	5
Paynecreek Variant	Loamy 12-16" Ppt Zone---------	Favorable	1,000	Idaho fescue----------	25
		Normal	800	Basin big sagebrush----------	25
		Unfavorable	600	Bluebunch wheatgrass----------	15
				Nevada bluegrass----------	5
				Arrowleaf balsamroot----------	5
				Tapertip hawksbeard----------	5
				Lupine----------	5
				Twistedleaf rabbitbrush-------	5
				Antelope bitterbrush----------	5
5*:					
Boulder Lake------	Churning Clay 12-16" Ppt Zone	Favorable	900	Silver sagebrush----------	35
		Normal	600	Bluegrass----------	25
		Unfavorable	400	Slender wheatgrass----------	15
				Rush----------	5
				Sedge----------	5

See footnote at end of table.

TABLE 6.--RANGELAND PRODUCTIVITY AND CHARACTERISTIC PLANT COMMUNITIES--Continued

Soil name and map symbol	Range site	Total production		Characteristic vegetation	Composition
		Kind of year	Dry weight		
			Lb/acre		Pct
5*:					
Tucker	Semi-Wet Meadow	Favorable	4,000	Sedge	20
		Normal	2,250	Tufted hairgrass	15
		Unfavorable	1,600	Slender wheatgrass	15
				Basin wildrye	5
				Rush	5
				Silver sagebrush	5
				Cinquefoil	5
				Groundsel	5
				Shrubby cinquefoil	5
				Willow	5
6*:					
Bulake	Shallow-Claypan 12-16" Ppt Zone.	Favorable	900	Idaho fescue	40
		Normal	650	Low sagebrush	20
		Unfavorable	400	Bluebunch wheatgrass	10
				Arrowleaf balsamroot	5
				Tapertip hawksbeard	5
				Basin rayless daisy	5
				Rabbitbrush	5
Deunah	Clayey 15-17" Ppt Zone	Favorable	1,400	Idaho fescue	35
		Normal	1,000	Alkali sagebrush	25
		Unfavorable	800	Bluebunch wheatgrass	10
				Nevada bluegrass	5
				Hooker balsamroot	5
				Bighead clover	5
				Low sagebrush	5
7*:					
Burmah Variant	Clayey 15-17" Ppt Zone	Favorable	1,400	Idaho fescue	30
		Normal	1,000	Alkali sagebrush	20
		Unfavorable	800	Bluebunch wheatgrass	10
				Nevada bluegrass	5
				Hooker balsamroot	5
				Tapertip hawksbeard	5
				Low sagebrush	5
				Tall green rabbitbrush	5
Torney Variant	Loamy 12-16" Ppt Zone	Favorable	1,100	Idaho fescue	25
		Normal	900	Basin big sagebrush	20
		Unfavorable	600	Bluebunch wheatgrass	15
				Bluegrass	10
				Arrowleaf balsamroot	5
				Tapertip hawksbeard	5
				Antelope bitterbrush	5
Yatahoney	Clayey 15-17" Ppt Zone	Favorable	1,100	Idaho fescue	35
		Normal	950	Alkali sagebrush	25
		Unfavorable	800	Bluebunch wheatgrass	10
				Hooker balsamroot	5
8*:					
Cavanaugh	Shallow-Claypan 12-16" Ppt Zone.	Favorable	1,200	Idaho fescue	20
		Normal	800	Low sagebrush	20
		Unfavorable	600	Bluebunch wheatgrass	10
				Arrowleaf balsamroot	10
				Nevada bluegrass	5
				Sandberg bluegrass	5
				Tapertip hawksbeard	5
				Longleaf phlox	5
				Alkali sagebrush	5
				Antelope bitterbrush	5
				Douglas rabbitbrush	5

See footnote at end of table.

TABLE 6.--RANGELAND PRODUCTIVITY AND CHARACTERISTIC PLANT COMMUNITIES--Continued

Soil name and map symbol	Range site	Total production		Characteristic vegetation	Composition
		Kind of year	Dry weight		
			Lb/acre		Pct
8*:					
Obray	Clay Seep 12-16" Ppt Zone	Favorable	1,200	Muleseardock	50
		Normal	850	Idaho fescue	10
		Unfavorable	700	Low sagebrush	10
				Bottlebrush squirreltail	5
				Lupine	5
9*:					
Cavanaugh	Shallow Claypan 12-16" Ppt Zone.	Favorable	1,200	Idaho fescue	20
		Normal	800	Low sagebrush	20
		Unfavorable	600	Bluebunch wheatgrass	10
				Arrowleaf balsamroot	10
				Nevada bluegrass	5
				Sandberg bluegrass	5
				Tapertip hawksbeard	5
				Longleaf phlox	5
				Alkali sagebrush	5
				Antelope bitterbrush	5
				Douglas rabbitbrush	5
Sattley	Loamy Slope 12-16" Ppt Zone	Favorable	1,600	Idaho fescue	25
		Normal	1,300	Bluebunch wheatgrass	20
		Unfavorable	900	Antelope bitterbrush	15
				Mountain big sagebrush	15
				Basin wildrye	5
				Tapertip hawksbeard	5
				Lupine	5
10*:					
Crooked Creek	Wet Meadow	Favorable	4,000	Sedge	25
		Normal	3,000	Tufted hairgrass	20
		Unfavorable	1,500	Nebraska sedge	10
				Rush	10
				Baltic rush	10
Bear Lake	Wet Meadow	Favorable	4,000	Sedge	30
		Normal	3,000	Tufted hairgrass	20
		Unfavorable	2,000	Rush	10
				Bluegrass	5
				Cinquefoil	5
11---- Deunah	Clayey 15-17" Ppt Zone	Favorable	1,400	Idaho fescue	35
		Normal	1,100	Alkali sagebrush	25
		Unfavorable	800	Bluebunch wheatgrass	10
				Nevada bluegrass	5
				Hooker balsamroot	5
				Bighead clover	5
				Low sagebrush	5
12---- Disabel Variant	Clay Basin 12-16" Ppt Zone	Favorable	1,100	Silver sagebrush	45
		Normal	850	Slender wheatgrass	15
		Unfavorable	600	Bluegrass	10
				Sedge	10
				Bottlebrush squirreltail	5
				Northern barley	5
13*:					
Disabel Variant	Clay Basin 12-16" Ppt Zone	Favorable	1,100	Silver sagebrush	45
		Normal	850	Slender wheatgrass	15
		Unfavorable	600	Bluegrass	10
				Sedge	10
				Bottlebrush squirreltail	5
				Northern barley	5

See footnote at end of table.

TABLE 6.--RANGELAND PRODUCTIVITY AND CHARACTERISTIC PLANT COMMUNITIES--Continued

Soil name and map symbol	Range site	Total production		Characteristic vegetation	Composition
		Kind of year	Dry weight		
			Lb/acre		Pct
13*:					
Bluecreek	Loamy 12-16" Ppt Zone	Favorable	1,300	Idaho fescue	25
		Normal	900	Basin big sagebrush	20
		Unfavorable	600	Bluebunch wheatgrass	15
				Nevada bluegrass	5
				Lupine	5
				Arrowleaf balsamroot	5
				Tapertip hawksbeard	5
				Antelope bitterbrush	5
14*:					
Dranyon	Aspen Thicket 16"+ Ppt Zone	Favorable	600	Slender wheatgrass	10
		Normal	450	Brome	10
		Unfavorable	300	Quaking aspen	10
				Columbia needlegrass	5
				Bluegrass	5
				Sedge	5
				Groundsel	5
				Geranium	5
				Cinquefoil	5
Strickland	Mountain Brush 18-22" Ppt Zone	Favorable	2,500	Mountain big sagebrush	25
		Normal	1,900	Mountain snowberry	15
		Unfavorable	1,500	Slender wheatgrass	5
				Mountain brome	5
				Douglas rabbitbrush	5
				Serviceberry	5
				Groundsel	5
				Lupine	5
				Geranium	5
				Quaking aspen	5
Parkay	Loamy 16-20" Ppt Zone	Favorable	1,800	Idaho fescue	30
		Normal	1,200	Bluebunch wheatgrass	15
		Unfavorable	800	Mountain big sagebrush	10
				Nevada bluegrass	5
				Arrowleaf balsamroot	5
				Lupine	5
				Tapertip hawksbeard	5
				Antelope bitterbrush	5
				Mountain snowberry	5
16 Hayspur	Semi-Wet Meadow	Favorable	4,000	Sedge	20
		Normal	2,250	Tufted hairgrass	15
		Unfavorable	1,600	Slender wheatgrass	15
				Rush	5
				Basin wildrye	5
				Cinquefoil	5
				Groundsel	5
				Shrubby cinquefoil	5
				Willow	5
				Silver sagebrush	5
18*:					
Hayspur	Semi-Wet Meadow	Favorable	4,000	Sedge	20
		Normal	2,250	Tufted hairgrass	15
		Unfavorable	1,600	Slender wheatgrass	15
				Rush	5
				Basin wildrye	5
				Cinquefoil	5
				Groundsel	5
				Shrubby cinquefoil	5
				Willow	5
				Silver sagebrush	5

See footnote at end of table.

TABLE 6.--RANGELAND PRODUCTIVITY AND CHARACTERISTIC PLANT COMMUNITIES--Continued

Soil name and map symbol	Range site	Total production		Characteristic vegetation	Composition
		Kind of year	Dry weight		
			Lb/acre		Pct
18*:					
Zola	Loamy 12-16" Ppt Zone	Favorable	1,300	Bluebunch wheatgrass	25
		Normal	1,000	Basin big sagebrush	20
		Unfavorable	600	Idaho fescue	15
				Bluegrass	10
				Arrowleaf balsamroot	5
				Tapertip hawksbeard	5
				Antelope bitterbrush	5
Paynecreek	Loamy 12-16" Ppt Zone	Favorable	1,300	Bluebunch wheatgrass	25
		Normal	900	Basin big sagebrush	20
		Unfavorable	600	Idaho fescue	15
				Bluegrass	10
				Basin wildrye	5
				Arrowleaf balsamroot	5
				Tapertip hawksbeard	5
				Rabbitbrush	5
19*:					
Lasauses Variant.					
Boulder Lake	Churning Clay 12-16" Ppt Zone	Favorable	900	Silver sagebrush	35
		Normal	600	Bluegrass	25
		Unfavorable	400	Slender wheatgrass	15
				Rush	5
				Sedge	5
20*:					
Moonstone	Granitic 13-16" Ppt Zone	Favorable	900	Bluebunch wheatgrass	25
		Normal	600	Idaho fescue	15
		Unfavorable	400	Mountain big sagebrush	15
				Antelope bitterbrush	10
				Arrowleaf balsamroot	5
				Nevada bluegrass	5
Earcree	Granitic 13-16" Ppt Zone	Favorable	900	Bluebunch wheatgrass	25
		Normal	600	Idaho fescue	15
		Unfavorable	400	Mountain big sagebrush	15
				Antelope bitterbrush	10
				Bluegrass	5
				Arrowleaf balsamroot	5
				Lupine	5
				Basin big sagebrush	5
21*:					
Parkay	North Slope Loamy 16-20" Ppt Zone.	Favorable	2,500	Idaho fescue	20
		Normal	1,800	Mountain big sagebrush	15
		Unfavorable	1,200	Arrowleaf balsamroot	10
				Antelope bitterbrush	10
				Bluebunch wheatgrass	5
				Nevada bluegrass	5
				Lupine	5
				Tapertip hawksbeard	5
				Mountain snowberry	5
Dranyon	Aspen Thicket 16"+ Ppt Zone	Favorable	600	Slender wheatgrass	10
		Normal	450	Brome	10
		Unfavorable	300	Quaking aspen	10
				Columbia needlegrass	5
				Bluegrass	5
				Sedge	5
				Groundsel	5
				Geranium	5
				Cinquefoil	5

See footnote at end of table.

TABLE 6.--RANGELAND PRODUCTIVITY AND CHARACTERISTIC PLANT COMMUNITIES--Continued

Soil name and map symbol	Range site	Total production		Characteristic vegetation	Composition
		Kind of year	Dry weight		
			Lb/acre		Pct
21*:					
Cavanaugh	Shallow-Claypan 12-16" Ppt Zone.	Favorable	1,200	Idaho fescue	20
		Normal	800	Low sagebrush	20
		Unfavorable	600	Bluebunch wheatgrass	10
				Arrowleaf balsamroot	10
				Nevada bluegrass	5
				Sandberg bluegrass	5
				Tapertip hawksbeard	5
				Longleaf phlox	5
				Alkali sagebrush	5
				Antelope bitterbrush	5
				Douglas rabbitbrush	5
22*:					
Parkay	Loamy 16-20" Ppt Zone	Favorable	1,800	Idaho fescue	30
		Normal	1,200	Bluebunch wheatgrass	15
		Unfavorable	800	Mountain big sagebrush	10
				Nevada bluegrass	5
				Arrowleaf balsamroot	5
				Lupine	5
				Tapertip hawksbeard	5
				Antelope bitterbrush	5
				Mountain snowberry	5
Wickahoney	Stony Clayey 12-16" Ppt Zone	Favorable	800	Idaho fescue	25
		Normal	500	Alkali sagebrush	20
		Unfavorable	300	Bluebunch wheatgrass	10
				Bluegrass	5
				Needlegrass	5
				Bottlebrush squirreltail	5
				Hooker balsamroot	5
				Phlox	5
				Low sagebrush	5
Boulder Lake	Churning Clay 12-16" Ppt Zone	Favorable	900	Silver sagebrush	35
		Normal	600	Bluegrass	25
		Unfavorable	400	Slender wheatgrass	15
				Rush	5
				Sedge	5
23, 24 Paynecreek	Loamy 12-16" Ppt Zone	Favorable	1,300	Bluebunch wheatgrass	25
		Normal	900	Basin big sagebrush	20
		Unfavorable	600	Idaho fescue	15
				Bluegrass	10
				Basin wildrye	5
				Arrowleaf balsamroot	5
				Tapertip hawksbeard	5
				Rabbitbrush	5
25*:					
Paynecreek	Loamy 12-16" Ppt Zone	Favorable	1,300	Bluebunch wheatgrass	25
		Normal	900	Basin big sagebrush	20
		Unfavorable	600	Idaho fescue	15
				Bluegrass	10
				Basin wildrye	5
				Arrowleaf balsamroot	5
				Tapertip hawksbeard	5
				Rabbitbrush	5
Thacker	Loamy 12-16" Ppt Zone	Favorable	1,300	Idaho fescue	25
		Normal	1,000	Basin big sagebrush	20
		Unfavorable	600	Bluebunch wheatgrass	10
				Nevada bluegrass	5
				Arrowleaf balsamroot	5
				Tapertip hawksbeard	5
				Lupine	5
				Twistedleaf rabbitbrush	5
				Antelope bitterbrush	5

See footnote at end of table.

TABLE 6.--RANGELAND PRODUCTIVITY AND CHARACTERISTIC PLANT COMMUNITIES--Continued

Soil name and map symbol	Range site	Total production		Characteristic vegetation	Composition
		Kind of year	Dry weight		
			Lb/acre		Pct
26*:					
Petan	Shallow-Claypan 12-16" Ppt Zone.	Favorable	1,000	Idaho fescue	25
		Normal	750	Bluebunch wheatgrass	15
		Unfavorable	500	Low sagebrush	15
				Nevada bluegrass	5
				Thurber needlegrass	5
				Cusick bluegrass	5
				Bottlebrush squirreltail	5
				Arrowleaf balsamroot	5
				Phlox	5
				Douglas rabbitbrush	5
Deunah	Clayey 15-17" Ppt Zone	Favorable	1,400	Idaho fescue	35
		Normal	1,100	Alkali sagebrush	25
		Unfavorable	800	Bluebunch wheatgrass	10
				Nevada bluegrass	5
				Hooker balsamroot	5
				Bighead clover	5
				Low sagebrush	5
Hatpeak	Loamy 12-16" Ppt Zone	Favorable	1,300	Idaho fescue	25
		Normal	1,000	Basin big sagebrush	20
		Unfavorable	600	Bluebunch wheatgrass	10
				Nevada bluegrass	5
				Arrowleaf balsamroot	5
				Tapertip hawksbeard	5
				Lupine	5
				Downy rabbitbrush	5
				Antelope bitterbrush	5
27*:					
Rubble land.					
Deunah	Clayey 15-17" Ppt Zone	Favorable	1,400	Idaho fescue	35
		Normal	1,100	Alkali sagebrush	25
		Unfavorable	800	Bluebunch wheatgrass	10
				Nevada bluegrass	5
				Hooker balsamroot	5
				Bighead clover	5
				Low sagebrush	5
29*:					
Searla	South Slope Loamy 12-16" Ppt Zone.	Favorable	1,100	Bluebunch wheatgrass	30
		Normal	900	Mountain big sagebrush	20
		Unfavorable	700	Idaho fescue	5
				Basin wildrye	5
				Nevada bluegrass	5
				Arrowleaf balsamroot	5
				Tapertip hawksbeard	5
				Lupine	5
				Antelope bitterbrush	5
				Tall green rabbitbrush	5
Povey	North Slope Loamy 16-20" Ppt Zone.	Favorable	2,500	Idaho fescue	20
		Normal	1,800	Mountain big sagebrush	15
		Unfavorable	1,200	Arrowleaf balsamroot	10
				Antelope bitterbrush	10
				Bluebunch wheatgrass	5
				Nevada bluegrass	5
				Lupine	5
				Tapertip hawksbeard	5
				Mountain snowberry	5

See footnote at end of table.

TABLE 6.--RANGELAND PRODUCTIVITY AND CHARACTERISTIC PLANT COMMUNITIES--Continued

Soil name and map symbol	Range site	Total production		Characteristic vegetation	Composition
		Kind of year	Dry weight		
			Lb/acre		Pct
30---------- Simonton	Loamy 12-16" Ppt Zone---------	Favorable	1,100	Bluebunch wheatgrass----------	25
		Normal	700	Basin big sagebrush----------	20
		Unfavorable	600	Idaho fescue----------	15
				Bluegrass----------	10
				Arrowleaf balsamroot----------	5
				Tapertip hawksbeard----------	5
				Antelope bitterbrush----------	5
31*:					
Simonton----------	Loamy 12-16" Ppt Zone---------	Favorable	1,100	Bluebunch wheatgrass----------	25
		Normal	700	Basin big sagebrush----------	20
		Unfavorable	600	Idaho fescue----------	15
				Bluegrass----------	10
				Arrowleaf balsamroot----------	5
				Tapertip hawksbeard----------	5
				Antelope bitterbrush----------	5
Bluecreek---------	Loamy 12-16" Ppt Zone---------	Favorable	1,300	Idaho fescue----------	25
		Normal	900	Basin big sagebrush----------	20
		Unfavorable	600	Bluebunch wheatgrass----------	15
				Nevada bluegrass----------	5
				Lupine----------	5
				Arrowleaf balsamroot----------	5
				Tapertip hawksbeard----------	5
				Antelope bitterbrush----------	5
32*, 33*:					
Simonton----------	Loamy 12-16" Ppt Zone---------	Favorable	1,100	Bluebunch wheatgrass----------	25
		Normal	700	Basin big sagebrush----------	20
		Unfavorable	600	Idaho fescue----------	15
				Bluegrass----------	10
				Arrowleaf balsamroot----------	5
				Tapertip hawksbeard----------	5
				Antelope bitterbrush----------	5
Thacker----------	Loamy 12-16" Ppt Zone---------	Favorable	1,300	Idaho fescue----------	25
		Normal	1,000	Basin big sagebrush----------	20
		Unfavorable	600	Bluebunch wheatgrass----------	10
				Nevada bluegrass----------	5
				Arrowleaf balsamroot----------	5
				Tapertip hawksbeard----------	5
				Lupine----------	5
				Twistedleaf rabbitbrush-------	5
				Antelope bitterbrush----------	5
34---------- Soonahbe	Loamy 12-16" Ppt Zone---------	Favorable	1,300	Bluebunch wheatgrass----------	25
		Normal	1,000	Basin big sagebrush----------	20
		Unfavorable	600	Idaho fescue----------	15
				Bluegrass----------	10
				Arrowleaf balsamroot----------	5
				Tapertip hawksbeard----------	5
				Antelope bitterbrush----------	5
35*:					
Soonahbe----------	Loamy 12-16" Ppt Zone---------	Favorable	1,300	Bluebunch wheatgrass----------	25
		Normal	1,000	Basin big sagebrush----------	20
		Unfavorable	600	Idaho fescue----------	15
				Bluegrass----------	10
				Arrowleaf balsamroot----------	5
				Tapertip hawksbeard----------	5
				Antelope bitterbrush----------	5

See footnote at end of table.

TABLE 6.--RANGELAND PRODUCTIVITY AND CHARACTERISTIC PLANT COMMUNITIES--Continued

Soil name and map symbol	Range site	Total production		Characteristic vegetation	Composition
		Kind of year	Dry weight		
			Lb/acre		Pct
35*:					
Thacker	Loamy 12-16" Ppt Zone	Favorable	1,300	Idaho fescue	25
		Normal	1,000	Basin big sagebrush	20
		Unfavorable	600	Bluebunch wheatgrass	10
				Nevada bluegrass	5
				Arrowleaf balsamroot	5
				Tapertip hawksbeard	5
				Lupine	5
				Twistedleaf rabbitbrush	5
				Antelope bitterbrush	5
36*:					
Soonahbe Variant	Loamy 12-16" Ppt Zone	Favorable	1,300	Bluebunch wheatgrass	25
		Normal	1,000	Basin big sagebrush	20
		Unfavorable	600	Idaho fescue	15
				Bluegrass	10
				Arrowleaf balsamroot	5
				Tapertip hawksbeard	5
				Antelope bitterbrush	5
Bulake	Shallow-Claypan 12-16" Ppt Zone.	Favorable	900	Idaho fescue	40
		Normal	650	Low sagebrush	20
		Unfavorable	400	Bluebunch wheatgrass	10
				Arrowleaf balsamroot	5
				Tapertip hawksbeard	5
				Basin rayless daisy	5
				Rabbitbrush	5
37*:					
Strickland	Mountain Brush 18-22" Ppt Zone	Favorable	2,500	Mountain big sagebrush	25
		Normal	1,900	Mountain snowberry	15
		Unfavorable	1,500	Slender wheatgrass	5
				Mountain brome	5
				Douglas rabbitbrush	5
				Serviceberry	5
				Groundsel	5
				Lupine	5
				Geranium	5
				Quaking aspen	5
Bluebell	Ceanothus Thicket 18-22" Ppt Zone.	Favorable	4,000	Snowbrush ceanothus	70
		Normal	3,000	Mountain brome	5
		Unfavorable	2,000	Indian paintbrush	5
				Oregon-grape	5
38, 39----------Thacker	Shallow-Claypan 12-16" Ppt Zone.	Favorable	950	Idaho fescue	25
		Normal	650	Bluebunch wheatgrass	20
		Unfavorable	350	Low sagebrush	20
				Nevada bluegrass	5
				Arrowleaf balsamroot	5
				Hooker balsamroot	5
				Tapertip hawksbeard	5
				Twistedleaf rabbitbrush	5
40*, 41*:					
Thacker	Shallow-Claypan 12-16" Ppt Zone.	Favorable	950	Idaho fescue	25
		Normal	650	Bluebunch wheatgrass	20
		Unfavorable	350	Low sagebrush	20
				Nevada bluegrass	5
				Arrowleaf balsamroot	5
				Hooker balsamroot	5
				Tapertip hawksbeard	5
				Twistedleaf rabbitbrush	5

See footnote at end of table.

TABLE 6.--RANGELAND PRODUCTIVITY AND CHARACTERISTIC PLANT COMMUNITIES--Continued

Soil name and map symbol	Range site	Total production		Characteristic vegetation	Composition
		Kind of year	Dry weight		
			Lb/acre		Pct
40*, 41*:					
Simonton	Loamy 12-16" Ppt Zone	Favorable	1,100	Bluebunch wheatgrass	25
		Normal	700	Basin big sagebrush	20
		Unfavorable	600	Idaho fescue	15
				Bluegrass	10
				Arrowleaf balsamroot	5
				Tapertip hawksbeard	5
				Antelope bitterbrush	5
42*:					
Thacker	Shallow-Claypan 12-16" Ppt Zone.	Favorable	950	Idaho fescue	25
		Normal	650	Bluebunch wheatgrass	20
		Unfavorable	350	Low sagebrush	20
				Nevada bluegrass	5
				Arrowleaf balsamroot	5
				Hooker balsamroot	5
				Tapertip hawksbeard	5
				Twistedleaf rabbitbrush	5
Soonahbe	Loamy 12-16" Ppt Zone	Favorable	1,300	Bluebunch wheatgrass	25
		Normal	1,000	Basin big sagebrush	20
		Unfavorable	600	Idaho fescue	15
				Bluegrass	10
				Arrowleaf balsamroot	5
				Tapertip hawksbeard	5
				Antelope bitterbrush	5
43*:					
Thacker	Shallow-Claypan 12-16" Ppt Zone.	Favorable	950	Idaho fescue	25
		Normal	650	Bluebunch wheatgrass	20
		Unfavorable	350	Low sagebrush	20
				Nevada bluegrass	5
				Arrowleaf balsamroot	5
				Hooker balsamroot	5
				Tapertip hawksbeard	5
				Twistedleaf rabbitbrush	5
Yatahoney	Clayey 15-17" Ppt Zone	Favorable	1,100	Idaho fescue	35
		Normal	950	Alkali sagebrush	25
		Unfavorable	800	Bluebunch wheatgrass	10
				Hooker balsamroot	5
44 Tucker	Semi-Wet Meadow	Favorable	4,000	Slender wheatgrass	15
		Normal	2,250	Basin wildrye	5
		Unfavorable	1,600	Rush	5
				Silver sagebrush	5
				Willow	5
45 Tucker	Semi-Wet Meadow	Favorable	4,000	Sedge	20
		Normal	2,250	Tufted hairgrass	15
		Unfavorable	1,600	Slender wheatgrass	15
				Basin wildrye	5
				Rush	5
				Silver sagebrush	5
				Cinquefoil	5
				Groundsel	5
				Shrubby cinquefoil	5
				Willow	5
46 Tucker Variant	Clay Basin 12-16" Ppt Zone	Favorable	1,100	Silver sagebrush	30
		Normal	900	Slender wheatgrass	15
		Unfavorable	600	Sedge	10
				Bluegrass	10
				Bottlebrush squirreltail	5
				Basin wildrye	5
				Lupine	5
				Tall gray rabbitbrush	5

See footnote at end of table.

TABLE 6.--RANGELAND PRODUCTIVITY AND CHARACTERISTIC PLANT COMMUNITIES--Continued

Soil name and map symbol	Range site	Total production		Characteristic vegetation	Composition
		Kind of year	Dry weight		
			Lb/acre		Pct
47*:					
Watchabob	Loamy 16-20" Ppt Zone	Favorable	1,800	Idaho fescue	25
		Normal	1,250	Mountain big sagebrush	20
		Unfavorable	800	Bluebunch wheatgrass	10
				Antelope bitterbrush	10
				Nevada bluegrass	5
				Basin wildrye	5
				Geranium	5
				Lupine	5
				Mountain snowberry	5
				Downy rabbitbrush	5
Bearskin Variant	Granitic 13-16" Ppt Zone	Favorable	900	Bluebunch wheatgrass	20
		Normal	650	Idaho fescue	20
		Unfavorable	400	Mountain big sagebrush	20
				Thurber needlegrass	10
				Arrowleaf balsamroot	5
				Tapertip hawksbeard	5
				Antelope bitterbrush	5
48 Wickahoney	Shallow-Claypan 12-16" Ppt Zone.	Favorable	850	Idaho fescue	35
		Normal	650	Low sagebrush	20
		Unfavorable	350	Bluebunch wheatgrass	10
				Bluegrass	5
				Needlegrass	5
				Hooker balsamroot	5
				Phlox	5
49*:					
Wickahoney	Stony Clayey 12-16" Ppt Zone	Favorable	800	Idaho fescue	25
		Normal	500	Alkali sagebrush	20
		Unfavorable	300	Bluebunch wheatgrass	10
				Bluegrass	5
				Needlegrass	5
				Bottlebrush squirreltail	5
				Hooker balsamroot	5
				Phlox	5
				Low sagebrush	5
Blackleg	Loamy 13-16" Ppt Zone	Favorable	1,600	Bluebunch wheatgrass	30
		Normal	1,000	Idaho fescue	20
		Unfavorable	700	Mountain big sagebrush	15
				Antelope bitterbrush	10
				Nevada bluegrass	5
				Arrowleaf balsamroot	5
50*:					
Wickahoney	Stony Clayey 12-16" Ppt Zone	Favorable	800	Idaho fescue	25
		Normal	500	Alkali sagebrush	20
		Unfavorable	300	Bluebunch wheatgrass	10
				Bluegrass	5
				Needlegrass	5
				Bottlebrush squirreltail	5
				Hooker balsamroot	5
				Phlox	5
				Low sagebrush	5
Wagonbox	Stony Clayey 12-16" Ppt Zone	Favorable	800	Idaho fescue	30
		Normal	750	Alkali sagebrush	20
		Unfavorable	300	Bluebunch wheatgrass	10
				Bluegrass	5
				Needlegrass	5
				Bottlebrush squirreltail	5
				Hooker balsamroot	5
				Phlox	5

See footnote at end of table.

TABLE 6.--RANGELAND PRODUCTIVITY AND CHARACTERISTIC PLANT COMMUNITIES--Continued

Soil name and map symbol	Range site	Total production		Characteristic vegetation	Composition
		Kind of year	Dry weight		
			Lb/acre		Pct
51*:					
Yatahoney	Clayey 15-17" Ppt Zone	Favorable	1,100	Idaho fescue	35
		Normal	950	Alkali sagebrush	25
		Unfavorable	800	Bluebunch wheatgrass	10
				Hooker balsamroot	5
Blackleg	Stony Loam 12-16" Ppt Zone	Favorable	900	Idaho fescue	35
		Normal	800	Basin big sagebrush	15
		Unfavorable	500	Bluebunch wheatgrass	10
				Nevada bluegrass	5
				Sandberg bluegrass	5
				Tapertip hawksbeard	5
				Tall green rabbitbrush	5
52*:					
Yatahoney	Clayey 15-17" Ppt Zone	Favorable	1,100	Idaho fescue	35
		Normal	950	Alkali sagebrush	25
		Unfavorable	800	Bluebunch wheatgrass	10
				Hooker balsamroot	5
Soonahbe	Loamy 12-16" Ppt Zone	Favorable	1,300	Bluebunch wheatgrass	25
		Normal	1,000	Basin big sagebrush	20
		Unfavorable	600	Idaho fescue	15
				Bluegrass	10
				Arrowleaf balsamroot	5
				Tapertip hawksbeard	5
				Antelope bitterbrush	5
53, 54 Zola	Loamy 12-16" Ppt Zone	Favorable	1,300	Bluebunch wheatgrass	25
		Normal	1,000	Basin big sagebrush	20
		Unfavorable	600	Idaho fescue	15
				Bluegrass	10
				Arrowleaf balsamroot	5
				Tapertip hawksbeard	5
				Antelope bitterbrush	5
55*:					
Zola	Loamy 12-16" Ppt Zone	Favorable	1,300	Bluebunch wheatgrass	25
		Normal	1,000	Basin big sagebrush	20
		Unfavorable	600	Idaho fescue	15
				Bluegrass	10
				Arrowleaf balsamroot	5
				Tapertip hawksbeard	5
				Antelope bitterbrush	5
Hayspur	Semi-Wet Meadow	Favorable	4,000	Sedge	20
		Normal	2,250	Tufted hairgrass	15
		Unfavorable	1,600	Slender wheatgrass	15
				Rush	5
				Basin wildrye	5
				Cinquefoil	5
				Groundsel	5
				Shrubby cinquefoil	5
				Willow	5
				Silver sagebrush	5

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 7.--WINDBREAKS AND ENVIRONMENTAL PLANTINGS

[The symbol < means less than. Absence of an entry indicates that trees generally do not grow to the given height on that soil. Only the soils suited to windbreaks and environmental plantings are listed.]

Soil name and map symbol	Trees having predicted 20-year average height, in feet, of--			
	<8	8-15	16-25	26-35
17*: Hayspur.				
Blackfoot	Nanking cherry, Peking cotoneaster, European privet.	Siberian peashrub, lilac, Rocky Mountain juniper.	Blue spruce, Scotch pine, Norway spruce.	Golden willow, Russian-olive, idahybrid poplar.
25*: Paynecreek	Nanking cherry, Peking cotoneaster.	Lilac, Tartarian honeysuckle, Siberian peashrub, Rocky Mountain juniper.	Scotch pine, blue spruce.	Idahybrid poplar, Russian-olive.
Thacker	Nanking cherry, Peking cotoneaster, lilac, Tatarian honeysuckle.	Siberian peashrub, Rocky Mountain juniper.	Norway spruce, blue spruce, Russian-olive, golden willow.	Idahybrid poplar.
30--- Simonton	Nanking cherry, Peking cotoneaster.	Rocky Mountain juniper, Siberian peashrub, lilac, Tatarian honeysuckle.	Scotch pine, blue spruce.	Idahybrid poplar, Russian-olive.
31*: Simonton	Nanking cherry, Peking cotoneaster.	Rocky Mountain juniper, Siberian peashrub, lilac, Tatarian honeysuckle.	Scotch pine, blue spruce.	Idahybrid poplar, Russian-olive.
32*, 33*: Simonton	Nanking cherry, Peking cotoneaster.	Rocky Mountain juniper, Siberian peashrub, lilac, Tatarian honeysuckle.	Scotch pine, blue spruce.	Idahybrid poplar, Russian-olive.
Thacker	Nanking cherry, Peking cotoneaster, lilac, Tatarian honeysuckle.	Siberian peashrub, Rocky Mountain juniper.	Norway spruce, blue spruce, Russian-olive, golden willow.	Idahybrid poplar.
34--- Soonahbe	Nanking cherry, Peking cotoneaster.	Lilac, Tatarian honeysuckle, Siberian peashrub, Rocky Mountain juniper.	Norway spruce, blue spruce.	Russian-olive, golden willow, idahybrid poplar.
35*: Soonahbe	Nanking cherry, Peking cotoneaster.	Lilac, Tatarian honeysuckle, Siberian peashrub, Rocky Mountain juniper.	Norway spruce, blue spruce.	Russian-olive, golden willow, idahybrid poplar.
35*: Thacker	Nanking cherry, Peking cotoneaster, lilac, Tatarian honeysuckle.	Siberian peashrub, Rocky Mountain juniper.	Norway spruce, blue spruce, Russian-olive, golden willow.	Idahybrid poplar.
38, 39--- Thacker	Nanking cherry, Peking cotoneaster, lilac, Tatarian honeysuckle.	Siberian peashrub, Rocky Mountain juniper.	Norway spruce, blue spruce, Russian-olive, golden willow.	Idahybrid poplar.

See footnote at end of table.

TABLE 7.--WINDBREAKS AND ENVIRONMENTAL PLANTINGS--Continued

Soil name and map symbol	Trees having predicted 20-year average height, in feet, of--			
	<8	8-15	16-25	26-35
40*, 41*: Thacker	Nanking cherry, Peking cotoneaster, lilac, Tatarian honeysuckle.	Siberian peashrub, Rocky Mountain juniper.	Norway spruce, blue spuce, Russian-olive, golden willow.	Idahybrid poplar.
Simonton	Nanking cherry, Peking cotoneaster. peashrub, lilac, Tatarian honeysuckle.	Rocky Mountain juniper, Siberian peashrub.	Scotch pine, blue spruce.	Idahybrid poplar, Russian-olive.
42*: Thacker	Nanking cherry, Peking cotoneaster, lilac, Tatarian honeysuckle.	Siberian peashrub, Rocky Mountain juniper.	Norway spruce, blue spruce, Russian-olive, golden willow.	Idahybrid poplar.
Soonahbe	Nanking cherry, Peking cotoneaster.	Lilac, Tatarian honeysuckle, Siberian peashrub, Rocky Mountain juniper.	Norway spruce, blue spruce.	Russian-olive, golden willow, idahybrid poplar.
45 Tucker	Tatarian honeysuckle, Nanking cherry.	Siberian peashrub, Rocky Mountain juniper.	Russian-olive, golden willow, green ash, Norway spruce.	---
53, 54 Zola	Nanking cherry, Peking cotoneaster.	Lilac, Rocky Mountain juniper, Tatarian honeysuckle.	Scotch pine	Russian-olive, golden willow.
55*: Zola	Nanking cherry, Peking cotoneaster.	Lilac, Rocky Mountain juniper, Tatarian honeysuckle.	Scotch pine	Russian-olive, golden willow.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 8.--RECREATIONAL DEVELOPMENT

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds
1*:			
Bedstead	Moderate: slope, dusty.	Moderate: slope, dusty.	Severe: large stones, slope.
Arbidge	Moderate: dusty.	Moderate: dusty.	Moderate: slope, small stones, cemented pan.
2*:			
Blackfoot	Severe: flooding.	Moderate: flooding. flooding, dusty.	Severe: wetness,
Tucker	Severe: flooding.	Moderate: flooding, wetness, dusty.	Severe: flooding.
3*:			
Bluecreek	Slight	Slight	Moderate: slope, small stones, cemented pan.
Thacker	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope, small stones.
4*:			
Bluecreek Variant	Severe: flooding.	Moderate: flooding, excess salt, percs slowly.	Severe: flooding.
Paynecreek Variant	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope, small stones, percs slowly.
5*:			
Boulder Lake	Severe: flooding.	Moderate: flooding, wetness, too clayey.	Severe: flooding.
Tucker	Severe: flooding.	Moderate: flooding, wetness, dusty.	Severe: flooding.
6*:			
Bulake	Severe: depth to rock.	Severe: depth to rock.	Severe: slope, depth to rock.
Deunah	Severe: large stones.	Severe: large stones.	Severe: large stones, slope.

See footnote at end of table.

TABLE 8.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds
7*:			
Burmah Variant	Severe: percs slowly.	Severe: percs slowly.	Severe: percs slowly.
Torney Variant	Severe: flooding.	Moderate: percs slowly.	Moderate: percs slowly.
Yatahoney	Severe: large stones.	Severe: large stones.	Severe: large stones.
8*:			
Cavanaugh	Severe: slope.	Severe: slope.	Severe: slope.
Obray	Moderate: slope, percs slowly.	Moderate: slope, too clayey.	Severe: slope.
9*:			
Cavanaugh	Severe: slope.	Severe: slope.	Severe: slope.
Sattley	Severe: slope.	Severe: slope.	Severe: slope, small stones.
10*:			
Crooked Creek	Severe: flooding, ponding.	Severe: ponding.	Severe: ponding.
Bear Lake	Severe: flooding, ponding.	Severe: ponding.	Severe: ponding.
11 Deunah	Moderate: percs slowly, dusty.	Moderate: percs slowly, dusty.	Moderate: large stones, slope.
12 Disabel Variant	Severe: flooding.	Moderate: percs slowly.	Moderate: flooding, percs slowly.
13*:			
Disabel Variant	Severe: flooding.	Moderate: percs slowly.	Moderate: flooding, percs slowly.
Bluecreek	Slight	Slight	Moderate: slope, small stones, cemented pan.
14*:			
Dranyon	Severe: slope.	Severe: slope.	Severe: slope.
Strickland	Moderate: slope.	Moderate: slope.	Severe: slope.
Parkay	Severe: slope.	Severe: slope.	Severe: slope.
15*:			
Haploxeralfs.			
Durixeralfs.			

See footnote at end of table.

TABLE 8.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds
15*: Rubble land.			
16---------- Hayspur	Severe: flooding, ponding.	Severe: ponding.	Severe: ponding, flooding.
17*: Hayspur----------	Severe: flooding, ponding.	Severe: ponding.	Severe: ponding, flooding.
Blackfoot----------	Severe: flooding.	Moderate: wetness, dusty.	Moderate: wetness, dusty.
18*: Hayspur----------	Severe: flooding, ponding.	Severe: ponding.	Severe: ponding, flooding.
Zola----------	Severe: flooding.	Moderate: flooding, dusty.	Severe: flooding.
Paynecreek----------	Moderate: small stones.	Moderate: small stones.	Severe: small stones.
19*: Lasauses Variant-----	Severe: ponding, percs slowly, too clayey.	Severe: ponding, too clayey, percs slowly.	Severe: too clayey, ponding, percs slowly.
Boulder Lake---------	Severe: ponding.	Severe: ponding.	Severe: ponding.
20*: Moonstone----------	Severe: slope.	Severe: slope.	Severe: slope, small stones.
Earcree----------	Severe: slope.	Severe: slope.	Severe: slope, small stones.
21*: Parkay----------	Severe: slope.	Severe: slope.	Severe: slope.
Dranyon----------	Severe: slope.	Severe: slope.	Severe: slope.
Cavanaugh----------	Severe: slope.	Severe: slope.	Severe: slope.
22*: Parkay----------	Severe: slope.	Severe: slope.	Severe: slope.
Wickahoney----------	Severe: slope, large stones, depth to rock.	Severe: slope, large stones, depth to rock.	Severe: large stones, slope, depth to rock.
Boulder Lake---------	Severe: flooding.	Moderate: flooding, wetness, too clayey.	Severe: flooding.

See footnote at end of table.

TABLE 8.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds
23--- Paynecreek	Moderate: small stones.	Moderate: small stones.	Severe: small stones.
24--- Paynecreek	Moderate: slope, small stones.	Moderate: slope, small stones.	Severe: slope, small stones.
25*: Paynecreek---	Moderate: small stones.	Moderate: small stones.	Severe: small stones.
Thacker---	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope, small stones.
26*: Petan---	Severe: large stones, depth to rock, cemented pan.	Severe: large stones, depth to rock, cemented pan.	Severe: large stones, slope, small stones.
Deunah---	Moderate: percs slowly, dusty.	Moderate: percs slowly, dusty.	Moderate: large stones, slope.
Hatpeak---	Moderate: dusty.	Moderate: dusty.	Moderate: slope, cemented pan, dusty.
27*: Rubble land.			
Deunah---	Moderate: percs slowly, dusty.	Moderate: percs slowly, dusty.	Moderate: large stones, slope.
28*: Rubble land.			
Rock outcrop.			
Argixerolls.			
29*: Searla---	Severe: slope.	Severe: slope.	Severe: slope, small stones.
Povey---	Severe: slope.	Severe: slope.	Severe: slope, small stones.
30--- Simonton	Slight---	Slight---	Moderate: slope, small stones.
31*: Simonton---	Slight---	Slight---	Moderate: slope, small stones.
Bluecreek---	Slight---	Slight---	Moderate: slope, small stones, cemented pan.

See footnote at end of table.

TABLE 8.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds
32*, 33*: Simonton	Slight	Slight	Moderate: slope, small stones.
Thacker	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope, small stones.
34 Soonahbe	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope, percs slowly.
35*: Soonahbe	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope, percs slowly.
Thacker	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope, small stones.
36*: Soonahbe Variant	Moderate: slope.	Moderate: slope.	Severe: slope.
Bulake	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.
37*: Strickland	Moderate: slope.	Moderate: slope.	Severe: slope.
Bluebell	Moderate: slope.	Moderate: slope.	Severe: slope.
38 Thacker	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope, small stones.
39 Thacker	Moderate: large stones, percs slowly.	Moderate: large stones, percs slowly.	Severe: slope, small stones.
40*, 41*: Thacker	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope, small stones.
Simonton	Slight	Slight	Moderate: slope, small stones.
42*: Thacker	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope, small stones.
Soonahbe	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope, percs slowly.
43*: Thacker	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope, small stones.

See footnote at end of table.

TABLE 8.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds
43*: Yatahoney	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: depth to rock.
44 Tucker	Severe: flooding.	Moderate: flooding, wetness.	Severe: flooding.
45 Tucker	Severe: flooding.	Moderate: flooding, wetness, dusty.	Severe: flooding.
46 Tucker Variant	Severe: flooding.	Moderate: flooding, wetness, percs slowly.	Severe: flooding.
47*: Watchabob	Severe: slope.	Severe: slope.	Severe: slope, small stones.
Bearskin Variant	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.
48 Wickahoney	Severe: depth to rock.	Severe: depth to rock.	Severe: slope, depth to rock.
49*: Wickahoney	Severe: slope, large stones, depth to rock.	Severe: slope, large stones, depth to rock.	Severe: large stones, slope, depth to rock.
Blackleg	Severe: slope.	Severe: slope.	Severe: slope.
50*: Wickahoney	Severe: large stones, depth to rock.	Severe: large stones, depth to rock.	Severe: large stones, depth to rock.
Wagonbox	Severe: depth to rock, cemented pan, large stones.	Severe: depth to rock, cemented pan, large stones.	Severe: depth to rock, large stones.
51*: Yatahoney	Severe: large stones.	Severe: large stones.	Severe: large stones.
Blackleg	Severe: large stones.	Severe: large stones.	Severe: large stones, slope.
52*: Yatahoney	Moderate: percs slowly.	Moderate: percs slowly.	Severe: slope.
Soonahbe	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope, percs slowly.
53 Zola	Severe: flooding.	Moderate: dusty.	Moderate: dusty.

See footnote at end of table.

TABLE 8.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds
54---------- Zola	Severe: flooding.	Moderate: flooding, dusty.	Severe: flooding.
55*: Zola----------	Severe: flooding.	Moderate: dusty.	Moderate: dusty.
Hayspur----------	Severe: flooding, ponding.	Severe: ponding.	Severe: ponding, flooding.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 9.--WILDLIFE HABITAT

[See text for definitions of "good," "fair," "poor," and "very poor." Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Potential for habitat elements						Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Shrubs	Wetland plants	Shallow water areas	Openland wildlife	Wetland wildlife	Rangeland wildlife
1*:									
Bedstead	Poor	Poor	Fair	Fair	Very poor	Very poor	Poor	Very poor	Fair.
Arbidge	Poor	Poor	Fair	Fair	Poor	Very poor	Poor	Very poor	Fair.
2*:									
Blackfoot	Fair	Good	Good	Good	Good	Good	Good	Good	Good.
Tucker	Very poor	Poor	Fair	Fair	Fair	Fair	Poor	Fair	Fair.
3*:									
Bluecreek	Poor	Poor	Good	Good	Poor	Very poor	Fair	Very poor	Good.
Thacker	Poor	Poor	Good	Good	Poor	Very poor	Fair	Very poor	Good.
4*:									
Bluecreek Variant-	Poor	Poor	Poor	Poor	Poor	Poor	Poor	Poor	Poor.
Paynecreek Variant	Fair	Fair	Good	Good	Poor	Very poor	Fair	Very poor	Good.
5*:									
Boulder Lake	---	---	Poor	Poor	Good	Good	---	Good	Poor.
Tucker	Very poor	Poor	Fair	Fair	Fair	Fair	Poor	Fair	Fair.
6*:									
Bulake	Poor	Poor	Fair	Poor	Very poor	Very poor	Poor	Very poor	Poor.
Deunah	Poor	Poor	Fair	Fair	Very poor	Very poor	Poor	Very poor	Fair.
7*:									
Burmah Variant	Poor	Poor	Good	Good	Poor	Very poor	Fair	Very poor	Good.
Torney Variant	Fair	Fair	Good	Good	Poor	Very poor	Fair	Very poor	Good.
Yatahoney	Poor	Poor	Fair	Fair	Very poor	Very poor	Poor	Very poor	Fair.
8*:									
Cavanaugh	---	---	Good	Good	---	---	---	---	Good.
Obray	Fair	Fair	Poor	Poor	Very poor	Very poor	Fair	Very poor	Poor.
9*:									
Cavanaugh	---	---	Good	Good	---	---	---	---	Good.
Sattley	Fair	Fair	Good	Good	Very poor	Very poor	Fair	Very poor	Good.
10*:									
Crooked Creek	Very poor	Poor	Fair	Fair	Good	Good	Poor	Good	Fair.
Bear Lake	Very poor	Very poor	Very poor	Very poor	Good	Good	Very poor	Good	Very poor.
11--Deunah	Poor	Poor	Good	Good	Poor	Very poor	Fair	Very poor	Good.
12--Disabel Variant	Poor	Fair	Poor	Poor	Fair	Good	Poor	Fair	Poor.
13*:									
Disabel Variant	Poor	Fair	Poor	Poor	Fair	Good	Poor	Fair	Poor.
Bluecreek	Poor	Poor	Good	Good	Poor	Very poor	Fair	Very poor	Good.

See footnote at end of table.

TABLE 9.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements						Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Shrubs	Wetland plants	Shallow water areas	Openland wildlife	Wetland wildlife	Rangeland wildlife
14*:									
Dranyon	Very poor	Very poor	Fair	Fair	Very poor	Very poor	Poor	Very poor	Fair.
Strickland	Poor	Poor	Good	Good	Very poor	Very poor	Fair	Very poor	Good.
Parkay	Poor	Poor	Good	Good	Very poor	Very poor	Fair	Very poor	Good.
15*:									
Haploxeralfs.									
Durixeralfs.									
Rubble land.									
16---------- Hayspur	Very poor	Poor	Fair	Fair	Good	Fair	Poor	Fair	Fair.
17*:									
Hayspur	Very poor	Poor	Fair	Fair	Good	Fair	Poor	Fair	Fair.
Blackfoot	Fair	Fair	Fair	Fair	Fair	Fair	Fair	Fair	Fair.
18*:									
Hayspur	Very poor	Poor	Fair	Fair	Good	Fair	Poor	Fair	Fair.
Zola	Very poor	Poor	Good	Good	Poor	Poor	Poor	Poor	Good.
Paynecreek	Fair	Fair	Good	Good	Poor	Very poor	Fair	Very poor	Good.
19*:									
Lasauses Variant	Very poor	Poor	Very poor	Very poor	Poor	Good	Very poor	Fair	Very poor.
Boulder Lake	---	---	Poor	Poor	Good	Good	---	Good	Poor.
20*:									
Moonstone	Poor	Poor	Good	Fair	Very poor	Very poor	Poor	Very poor	Fair.
Earcree	Poor	Poor	Good	Good	Very poor	Very poor	Fair	Very poor	Good.
21*:									
Parkay	Very poor	Very poor	Good	Good	Very poor	Very poor	Poor	Very poor	Good.
Dranyon	Very poor	Very poor	Fair	Fair	Very poor	Very poor	Poor	Very poor	Fair.
Cavanaugh	---	---	Good	Good	---	---	---	---	Good.
22*:									
Parkay	Poor	Poor	Good	Good	Very poor	Very poor	Fair	Very poor	Good.
Wickahoney	Very poor	Very poor	Fair	Poor	Very poor	Very poor	Poor	Very poor	Poor.
Boulder Lake	---	---	Poor	Poor	Good	Good	---	Good	Poor.
23---------- Paynecreek	Fair	Fair	Good	Good	Poor	Very poor	Fair	Very poor	Good.
24---------- Paynecreek	Fair	Fair	Good	Good	Very poor	Very poor	Fair	Very poor	Good.
25*:									
Paynecreek	Fair	Fair	Good	Good	Poor	Very poor	Fair	Very poor	Good.
Thacker	Poor	Poor	Good	Good	Poor	Very poor	Fair	Very poor	Good.

See footnote at end of table.

TABLE 9.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements						Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Shrubs	Wetland plants	Shallow water areas	Openland wildlife	Wetland wildlife	Rangeland wildlife
26*:									
Petan	---	---	Fair	Fair	---	---	---	---	Fair.
Deunah	Poor	Poor	Good	Good	Poor	Very poor	Fair	Very poor	Good.
Hatpeak	Poor	Poor	Good	Good	Poor	Very poor	Fair	Very poor	Good.
27*:									
Rubble land.									
Deunah	Poor	Poor	Good	Good	Poor	Very poor	Fair	Very poor	Good.
28*:									
Rubble land.									
Rock outcrop.									
Argixerolls.									
29*:									
Searla	Very poor	Very poor	Good	Good	Very poor	Very poor	Poor	Very poor	Good.
Povey	Very poor	Very poor	Good	Good	Very poor	Very poor	Poor	Very poor	Good.
30 Simonton	Fair	Fair	Good	Good	Poor	Very poor	Fair	Very poor	Good.
31*:									
Simonton	Fair	Fair	Good	Good	Poor	Very poor	Fair	Very poor	Good.
Bluecreek	Poor	Poor	Good	Good	Poor	Very poor	Fair	Very poor	Good.
32*, 33*:									
Simonton	Fair	Fair	Good	Good	Poor	Very poor	Fair	Very poor	Good.
Thacker	Poor	Poor	Good	Good	Poor	Very poor	Fair	Very poor	Good.
34 Soonahbe	Fair	Fair	Good	Good	Poor	Very poor	Fair	Very poor	Good.
35*:									
Soonahbe	Fair	Fair	Good	Good	Poor	Very poor	Fair	Very poor	Good.
Thacker	Poor	Poor	Good	Good	Poor	Very poor	Fair	Very poor	Good.
36*:									
Soonahbe Variant	Poor	Poor	Good	Good	Very poor	Very poor	Fair	Very poor	Good.
Bulake	Poor	Poor	Fair	Poor	Very poor	Very poor	Poor	Very poor	Poor.
37*:									
Strickland	Poor	Poor	Good	Good	Very poor	Very poor	Fair	Very poor	Good.
Bluebell	Poor	Poor	Good	Good	Very poor	Very poor	Fair	Very poor	Good.
38, 39 Thacker	Poor	Poor	Good	Good	Poor	Very poor	Fair	Very poor	Good.
40*, 41*:									
Thacker	Poor	Poor	Good	Good	Poor	Very poor	Fair	Very poor	Good.
Simonton	Fair	Fair	Good	Good	Poor	Very poor	Fair	Very poor	Good.
42*:									
Thacker	Poor	Poor	Good	Good	Poor	Very poor	Fair	Very poor	Good.

See footnote at end of table.

TABLE 9.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements						Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Shrubs	Wetland plants	Shallow water areas	Openland wildlife	Wetland wildlife	Rangeland wildlife
42*:									
Soonahbe	Fair	Fair	Good	Good	Poor	Very poor	Fair	Very poor	Good.
43*:									
Thacker	Poor	Poor	Good	Good	Poor	Very poor	Fair	Very poor	Good.
Yatahoney	Poor	Poor	Fair	Fair	Very poor	Very poor	Poor	Very poor	Fair.
44--Tucker	Very poor	Poor	Fair	Fair	Fair	Fair	Fair	Fair	Fair.
45--Tucker	Very poor	Poor	Fair	Fair	Fair	Fair	Poor	Fair	Fair.
46--Tucker Variant	Very poor	Poor	Fair	Fair	Good	Fair	Poor	Fair	Fair.
47*:									
Watchabob	Poor	Poor	Fair	Fair	Very poor	Very poor	Poor	Very poor	Fair.
Bearskin Variant	Poor	Poor	Poor	Poor	Very poor	Very poor	Poor	Very poor	Poor.
48--Wickahoney	Poor	Poor	Fair	Poor	Very poor	Very poor	Poor	Very poor	Poor.
49*:									
Wickahoney	Very poor	Very poor	Fair	Poor	Very poor	Very poor	Poor	Very poor	Poor.
Blackleg	Poor	Fair	Good	Good	Very poor	Very poor	Fair	Very poor	Good.
50*:									
Wickahoney	Very poor	Very poor	Fair	Poor	Very poor	Very poor	Poor	Very poor	Poor.
Wagonbox	Poor	Poor	Fair	Fair	Very poor	Very poor	Poor	Very poor	Fair.
51*:									
Yatahoney	Poor	Poor	Fair	Fair	Very poor	Very poor	Poor	Very poor	Fair.
Blackleg	Very poor	Very poor	Good	Poor	Poor	Very poor	Poor	Very poor	Fair.
52*:									
Yatahoney	Poor	Poor	Fair	Fair	Very poor	Very poor	Poor	Very poor	Fair.
Soonahbe	Fair	Fair	Good	Good	Poor	Very poor	Fair	Very poor	Good.
53--Zola	Fair	Fair	Good	Good	Poor	Good	Fair	Fair	Good.
54--Zola	Very poor	Poor	Good	Good	Poor	Poor	Poor	Poor	Good.
55*:									
Zola	Fair	Fair	Good	Good	Poor	Good	Fair	Fair	Good.
Hayspur	Very poor	Poor	Fair	Fair	Good	Fair	Poor	Fair	Fair.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 10.--BUILDING SITE DEVELOPMENT

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation]

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
1*:						
Bedstead	Severe: depth to rock, large stones.	Severe: shrink-swell, large stones.	Severe: depth to rock, shrink-swell.	Severe: shrink-swell, slope, large stones.	Severe: low strength, shrink-swell.	Severe: large stones.
Arbidge	Severe: cutbanks cave.	Slight	Moderate: cemented pan.	Moderate: slope.	Moderate: frost action.	Moderate: thin layer.
2*:						
Blackfoot	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Severe: frost action.	Slight.
Tucker	Severe: cutbanks cave, wetness.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Severe: low strength, flooding, frost action.	Severe: flooding.
3*:						
Bluecreek	Severe: cemented pan, cutbanks cave.	Moderate: cemented pan.	Severe: cemented pan.	Moderate: cemented pan.	Moderate: cemented pan, frost action.	Moderate: thin layer.
Thacker	Severe: cutbanks cave.	Slight	Moderate: cemented pan.	Slight	Moderate: frost action.	Moderate: thin layer.
4*:						
Bluecreek Variant	Severe: cutbanks cave.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.
Paynecreek Variant	Severe: cutbanks cave.	Moderate: shrink-swell.	Slight	Moderate: shrink-swell.	Severe: low strength.	Slight.
5*:						
Boulder Lake	Severe: cutbanks cave, wetness.	Severe: flooding, shrink-swell.	Severe: flooding, wetness, shrink-swell.	Severe: flooding, shrink-swell.	Severe: low strength, flooding, shrink-swell.	Severe: flooding, too clayey.
Tucker	Severe: cutbanks cave, wetness.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Severe: low strength, flooding, frost action.	Severe: flooding.
6*:						
Bulake	Severe: depth to rock.	Severe: shrink-swell, depth to rock.	Severe: depth to rock, shrink-swell.	Severe: shrink-swell, slope, depth to rock.	Severe: depth to rock, low strength.	Severe: thin layer.
Deunah	Severe: depth to rock, cemented pan.	Severe: shrink-swell.	Severe: depth to rock, cemented pan, shrink-swell.	Severe: shrink-swell.	Severe: low strength, shrink-swell.	Severe: large stones.
7*:						
Burmah Variant	Moderate: too clayey.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: low strength, shrink-swell.	Slight.
Torney Variant	Moderate: too clayey.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: low strength, frost action.	Slight.

See footnote at end of table.

TABLE 10.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
7*:						
Yatahoney	Severe: depth to rock, cemented pan.	Moderate: shrink-swell, depth to rock.	Severe: depth to rock, cemented pan.	Moderate: shrink-swell, depth to rock.	Moderate: depth to rock, cemented pan.	Severe: large stones.
8*:						
Cavanaugh	Severe: depth to rock, slope.	Severe: shrink-swell, slope.	Severe: depth to rock, slope, shrink-swell.	Severe: shrink-swell, slope.	Severe: low strength, slope, shrink-swell.	Severe: slope.
Obray	Severe: cutbanks cave.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell, slope.	Severe: low strength, shrink-swell.	Severe: too clayey.
9*:						
Cavanaugh	Severe: depth to rock, slope.	Severe: shrink-swell, slope.	Severe: depth to rock, slope, shrink-swell.	Severe: shrink-swell, slope.	Severe: low strength, slope, shrink-swell.	Severe: slope.
Sattley	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
10*:						
Crooked Creek	Severe: ponding.	Severe: flooding, ponding, shrink-swell.	Severe: flooding, ponding, shrink-swell.	Severe: flooding, ponding, shrink-swell.	Severe: low strength, ponding, frost action.	Severe: ponding.
Bear Lake	Severe: ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: low strength, ponding, frost action.	Severe: ponding.
11 Deunah	Severe: depth to rock, cemented pan.	Severe: shrink-swell.	Severe: depth to rock, cemented pan, shrink-swell.	Severe: shrink-swell.	Severe: low strength, shrink-swell.	Moderate: large stones, thin layer.
12 Disabel Variant	Moderate: too clayey, flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: low strength, flooding.	Moderate: flooding.
13*:						
Disabel Variant	Moderate: too clayey, flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: low strength, flooding.	Moderate: flooding.
Bluecreek	Severe: cemented pan, cutbanks cave.	Moderate: cemented pan.	Severe: cemented pan.	Moderate: cemented pan.	Moderate: cemented pan, frost action.	Moderate: thin layer.
14*:						
Dranyon	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Strickland	Severe: depth to rock.	Moderate: shrink-swell, slope, depth to rock.	Severe: depth to rock.	Severe: slope.	Moderate: depth to rock, slope, frost action.	Moderate: large stones, slope, thin layer.
Parkay	Severe: large stones, slope.	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope.
15*:						
Haploxeralfs.						
Durixeralfs.						

See footnote at end of table.

TABLE 10.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
15*: Rubble land.						
16---------- Hayspur	Severe: cutbanks cave, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: low strength, ponding, flooding.	Severe: ponding, flooding.
17*: Hayspur----------	Severe: cutbanks cave, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: low strength, ponding, flooding.	Severe: ponding, flooding.
Blackfoot--------	Severe: wetness.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Severe: frost action.	Slight.
18*: Hayspur----------	Severe: cutbanks cave, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: low strength, ponding, flooding.	Severe: ponding, flooding.
Zola----------	Moderate: wetness, flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: low strength, flooding.	Severe: flooding.
Paynecreek-------	Slight---------	Moderate: shrink-swell.	Slight---------	Moderate: shrink-swell.	Moderate: frost action, shrink-swell.	Moderate: small stones.
19*: Lasauses Variant-	Severe: ponding.	Severe: ponding, shrink-swell.	Severe: ponding, shrink-swell.	Severe: ponding, shrink-swell.	Severe: low strength, ponding, frost action.	Severe: ponding, too clayey.
Boulder Lake-----	Severe: cutbanks cave, ponding.	Severe: ponding, shrink-swell.	Severe: ponding, shrink-swell.	Severe: ponding, shrink-swell.	Severe: low strength, ponding, shrink-swell.	Severe: ponding, too clayey.
20*: Moonstone--------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Earcree----------	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
21*: Parkay----------	Severe: large stones, slope.	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope.
Dranyon----------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Cavanaugh--------	Severe: depth to rock, slope.	Severe: shrink-swell, slope.	Severe: depth to rock, slope, shrink-swell.	Severe: shrink-swell, slope.	Severe: low strength, slope, shrink-swell.	Severe: slope.
22*: Parkay----------	Severe: large stones, slope.	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope.

See footnote at end of table.

TABLE 10.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
22*: Wickahoney	Severe: depth to rock, slope, large stones.	Severe: shrink-swell, slope, depth to rock.	Severe: depth to rock, slope, shrink-swell.	Severe: shrink-swell, slope, depth to rock.	Severe: depth to rock, low strength, slope.	Severe: largestones, slope, thin layer.
Boulder Lake	Severe: cutbanks cave, wetness.	Severe: flooding, shrink-swell.	Severe: flooding, wetness, shrink-swell.	Severe: flooding, shrink-swell.	Severe: low strength, flooding, shrink-swell.	Severe: flooding, too clayey.
23--- Paynecreek	Slight	Moderate: shrink-swell.	Slight	Moderate: shrink-swell.	Moderate: frost action, shrink-swell.	Moderate: small stones.
24--- Paynecreek	Moderate: slope.	Moderate: shrink-swell, slope.	Moderate: slope.	Severe: slope.	Moderate: slope, frost action, shrink-swell.	Moderate: small stones, slope.
25*: Paynecreek	Slight	Moderate: shrink-swell.	Slight	Moderate: shrink-swell, slope.	Moderate: frost action, shrink-swell.	Moderate: small stones.
Thacker	Severe: cutbanks cave.	Slight	Moderate: cemented pan.	Moderate: slope.	Moderate: frost action.	Moderate: thin layer.
26*: Petan	Severe: depth to rock, cemented pan, large stones.	Severe: depth to rock, large stones.	Severe: depth to rock, cemented pan, large stones.	Severe: depth to rock, large stones.	Severe: depth to rock, low strength, large stones.	Severe: large stones, thin layer.
Deunah	Severe: depth to rock, cemented pan.	Severe: shrink-swell.	Severe: depth to rock, cemented pan, shrink-swell.	Severe: shrink-swell.	Severe: low strength, shrink-swell.	Moderate: large stones, thin layer.
Hatpeak	Severe: cemented pan.	Severe: shrink-swell.	Severe: cemented pan, shrink-swell.	Severe: shrink-swell.	Severe: low strength, frost action, shrink-swell.	Moderate: large stones, thin layer.
27*: Rubble land.						
Deunah	Severe: depth to rock, cemented pan.	Severe: shrink-swell.	Severe: depth to rock, cemented pan, shrink-swell.	Severe: shrink-swell.	Severe: low strength, shrink-swell.	Moderate: large stones, thin layer.
28*: Rubble land. Rock outcrop. Argixerolls.						
29*: Searla	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Povey	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
30--- Simonton	Severe: cutbanks cave.	Slight	Slight	Slight	Moderate: frost action.	Slight.

See footnote at end of table.

TABLE 10.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
31*:						
Simonton	Severe: cutbanks cave.	Slight	Slight	Slight	Moderate: frost action.	Slight.
Bluecreek	Severe: cemented pan, cutbanks cave.	Moderate: cemented pan.	Severe: cemented pan.	Moderate: cemented pan.	Moderate: cemented pan, frost action.	Moderate: thin layer.
32*:						
Simonton	Severe: cutbanks cave.	Slight	Slight	Slight	Moderate: frost action.	Slight.
Thacker	Severe: cutbanks cave.	Slight	Moderate: cemented pan.	Slight	Moderate: frost action.	Moderate: thin layer.
33*:						
Simonton	Severe: cutbanks cave.	Slight	Slight	Moderate: slope.	Moderate: frost action.	Slight.
Thacker	Severe: cutbanks cave.	Slight	Moderate: cemented pan.	Moderate: slope.	Moderate: frost action.	Moderate: thin layer.
34--- Soonahbe	Moderate: cemented pan.	Moderate: shrink-swell.	Moderate: cemented pan, shrink-swell.	Moderate: shrink-swell.	Severe: low strength.	Slight.
35*:						
Soonahbe	Moderate: cemented pan.	Moderate: shrink-swell.	Moderate: cemented pan, shrink-swell.	Moderate: shrink-swell.	Severe: low strength.	Slight.
Thacker	Severe: cutbanks cave.	Slight	Moderate: cemented pan.	Slight	Moderate: frost action.	Moderate: thin layer.
36*:						
Soonahbe Variant-	Moderate: depth to rock, slope.	Moderate: shrink-swell, slope.	Moderate: depth to rock, slope, shrink-swell.	Severe: slope.	Moderate: slope, frost action, shrink-swell.	Moderate: slope, thin layer.
Bulake	Severe: depth to rock.	Severe: shrink-swell, depth to rock.	Severe: depth to rock, shrink-swell.	Severe: shrink-swell, depth to rock.	Severe: depth to rock, low strength.	Severe: thin layer.
37*:						
Strickland	Severe: depth to rock.	Moderate: shrink-swell, slope, depth to rock.	Severe: depth to rock.	Severe: slope.	Moderate: depth to rock, slope, frost action.	Moderate: large stones, slope, thin layer.
Bluebell	Moderate: depth to rock, large stones, slope.	Moderate: slope, large stones.	Moderate: depth to rock, slope, large stones.	Severe: slope.	Moderate: slope, frost action, large stones.	Moderate: large stones, slope, thin layer.
38--- Thacker	Severe: cutbanks cave.	Slight	Moderate: cemented pan.	Slight	Moderate: frost action.	Moderate: thin layer.
39--- Thacker	Severe: cutbanks cave.	Slight	Moderate: cemented pan.	Moderate: slope.	Moderate: frost action.	Moderate: small stones, large stones, thin layer.
40*:						
Thacker	Severe: cutbanks cave.	Slight	Moderate: cemented pan.	Slight	Moderate: frost action.	Moderate: thin layer.
Simonton	Severe: cutbanks cave.	Slight	Slight	Slight	Moderate: frost action.	Slight.

See footnote at end of table.

TABLE 10.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
41*:						
Thacker	Severe: cutbanks cave.	Slight	Moderate: cemented pan.	Moderate: slope.	Moderate: frost action.	Moderate: thin layer.
Simonton	Severe: cutbanks cave.	Slight	Slight	Moderate: slope.	Moderate: frost action.	Slight.
42*:						
Thacker	Severe: cutbanks cave.	Slight	Moderate: cemented pan.	Moderate: slope.	Moderate: frost action.	Moderate: thin layer.
Soonahbe	Moderate: cemented pan.	Moderate: shrink-swell.	Moderate: cemented pan, shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength.	Slight.
43*:						
Thacker	Severe: cutbanks cave.	Slight	Moderate: cemented pan.	Moderate: slope.	Moderate: frost action.	Moderate: thin layer.
Yatahoney	Severe: depth to rock, cemented pan.	Moderate: shrink-swell, depth to rock.	Severe: depth to rock, cemented pan.	Moderate: shrink-swell, slope, depth to rock.	Moderate: depth to rock, cemented pan.	Moderate: thin layer.
44--- Tucker	Severe: wetness.	Severe: flooding, shrink-swell.	Severe: flooding, wetness, shrink-swell.	Severe: flooding, shrink-swell.	Severe: low strength, flooding, frost action.	Severe: flooding.
45--- Tucker	Severe: cutbanks cave, wetness.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Severe: low strength, flooding, frost action.	Severe: flooding.
46--- Tucker Variant	Severe: cutbanks cave, wetness.	Severe: flooding, shrink-swell.	Severe: flooding, wetness.	Severe: flooding, shrink-swell.	Severe: low strength, flooding, shrink-swell.	Severe: flooding.
47*:						
Watchabob	Severe: depth to rock, slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Severe: slope.	Severe: slope.
Bearskin Variant-	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, thin layer.
48--- Wickahoney	Severe: depth to rock.	Severe: shrink-swell, depth to rock.	Severe: depth to rock, shrink-swell.	Severe: shrink-swell, slope, depth to rock.	Severe: depth to rock, low strength.	Severe: thin layer.
49*:						
Wickahoney	Severe: depth to rock, slope, large stones.	Severe: shrink-swell, slope, depth to rock.	Severe: depth to rock, slope, shrink-swell.	Severe: shrink-swell, slope, depth to rock.	Severe: depth to rock, low strength, slope.	Severe: large stones, slope, thin layer.
Blackleg	Severe: cemented pan, slope.	Severe: shrink-swell, slope.	Severe: cemented pan, slope, shrink-swell.	Severe: shrink-swell, slope.	Severe: slope, shrink-swell.	Severe: large stones, slope.
50*:						
Wickahoney	Severe: depth to rock, large stones.	Severe: shrink-swell, depth to rock.	Severe: depth to rock, shrink-swell.	Severe: shrink-swell, depth to rock.	Severe: depth to rock, low strength.	Severe: large stones, thin layer.

See footnote at end of table.

TABLE 10.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
50*: Wagonbox	Severe: depth to rock, cemented pan, large stones.	Severe: shrink-swell, depth to rock, large stones.	Severe: depth to rock, cemented pan, shrink-swell.	Severe: shrink-swell, depth to rock, large stones.	Severe: depth to rock, low strength, shrink-swell.	Severe: large stones, thin layer.
51*: Yatahoney	Severe: depth to rock, cemented pan.	Moderate: shrink-swell, depth to rock.	Severe: depth to rock, cemented pan.	Moderate: shrink-swell, slope, depth to rock.	Moderate: depth to rock, cemented pan.	Severe: large stones.
Blackleg	Severe: cemented pan.	Severe: shrink-swell.	Severe: cemented pan, shrink-swell.	Severe: shrink-swell, slope.	Severe: low strength, shrink-swell.	Severe: large stones.
52*: Yatahoney	Severe: depth to rock, cemented pan.	Moderate: shrink-swell, depth to rock.	Severe: depth to rock, cemented pan.	Moderate: shrink-swell, slope, depth to rock.	Moderate: depth to rock, cemented pan.	Moderate: thin layer.
Soonahbe	Moderate: cemented pan.	Moderate: shrink-swell.	Moderate: cemented pan, shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength.	Slight.
53--- Zola	Moderate: wetness.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: low strength.	Slight.
54--- Zola	Moderate: wetness, flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: low strength, flooding.	Severe: flooding.
55*: Zola	Moderate: wetness.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: low strength.	Slight.
Hayspur	Severe: cutbanks cave, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: low strength, ponding, flooding.	Severe: ponding, flooding.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 11.--SANITARY FACILITIES

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "good," and other terms. Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation]

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
1*:					
Bedstead	Severe: depth to rock, cemented pan.	Severe: depth to rock, cemented pan, slope.	Severe: depth to rock, large stones.	Severe: depth to rock, cemented pan.	Poor: area reclaim, hard to pack, large stones.
Arbidge	Severe: cemented pan.	Severe: seepage, cemented pan.	Severe: too sandy.	Severe: cemented pan.	Poor: area reclaim, seepage, too sandy.
2*:					
Blackfoot	Severe: wetness, flooding.	Severe: wetness.	Severe: wetness, flooding.	Severe: wetness, flooding.	Fair: too clayey, wetness.
Tucker	Severe: flooding, wetness, percs slowly.	Severe: seepage, wetness.	Severe: flooding, seepage, wetness.	Severe: flooding, wetness.	Poor: thin layer.
3*:					
Bluecreek	Severe: cemented pan.	Severe: seepage, cemented pan.	Severe: cemented pan, seepage, too sandy.	Severe: cemented pan, seepage.	Poor: area reclaim, seepage, too sandy.
Thacker	Severe: cemented pan, poor filter.	Severe: seepage, cemented pan.	Severe: seepage, too sandy.	Severe: cemented pan, seepage.	Poor: area reclaim, seepage, too sandy.
4*:					
Bluecreek Variant	Severe: flooding, wetness, poor filter.	Severe: seepage, wetness.	Severe: flooding, seepage, wetness.	Severe: flooding, seepage, wetness.	Poor: seepage, too sandy, small stones.
Paynecreek Variant	Severe: percs slowly, poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy, small stones.
5*:					
Boulder Lake	Severe: flooding, wetness, percs slowly.	Severe: wetness.	Severe: flooding, wetness, too clayey.	Severe: flooding.	Poor: too clayey, hard to pack.
Tucker	Severe: flooding, wetness, percs slowly.	Severe: seepage, wetness.	Severe: flooding, seepage, wetness.	Severe: flooding, wetness.	Poor: thin layer.
6*:					
Bulake	Severe: depth to rock.	Severe: depth to rock, slope.	Severe: depth to rock, too clayey.	Severe: depth to rock.	Poor: area reclaim, too clayey, hard to pack.

See footnote at end of table.

TABLE 11.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
6*:					
Deunah	Severe: depth to rock, cemented pan, percs slowly.	Severe: depth to rock, cemented pan.	Severe: depth to rock, cemented pan, too clayey.	Severe: depth to rock, cemented pan.	Poor: area reclaim, too clayey, hard to pack.
7*:					
Burmah Variant	Severe: percs slowly.	Slight	Severe: too clayey.	Slight	Poor: too clayey, hard to pack.
Torney Variant	Severe: percs slowly.	Moderate: seepage.	Moderate: flooding, too clayey.	Moderate: flooding.	Fair: too clayey.
Yatahoney	Severe: depth to rock, cemented pan, percs slowly.	Severe: depth to rock, cemented pan.	Severe: depth to rock, cemented pan.	Severe: depth to rock, cemented pan.	Poor: area reclaim.
8*:					
Cavanaugh	Severe: depth to rock, percs slowly, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope, too clayey.	Severe: depth to rock, slope.	Poor: area reclaim, too clayey, hard to pack.
Obray	Severe: percs slowly.	Severe: slope.	Severe: too clayey.	Moderate: slope.	Poor: too clayey, hard to pack.
9*:					
Cavanaugh	Severe: depth to rock, percs slowly, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope, too clayey.	Severe: depth to rock, slope.	Poor: area reclaim, too clayey, hard to pack.
Sattley	Severe: slope.	Severe: slope.	Severe: depth to rock, slope, large stones.	Severe: slope.	Poor: small stones, slope.
10*:					
Crooked Creek	Severe: ponding, percs slowly.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Poor: ponding.
Bear Lake	Severe: ponding, percs slowly.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Poor: ponding.
11 Deunah	Severe: depth to rock, cemented pan.	Severe: depth to rock, cemented pan.	Severe: depth to rock, cemented pan, too clayey.	Severe: depth to rock, cemented pan.	Poor: area reclaim, too clayey, hard to pack.
12 Disabel Variant	Severe: flooding, percs slowly.	Moderate: seepage.	Severe: flooding.	Severe: flooding.	Fair: too clayey.
13*:					
Disabel Variant	Severe: flooding, percs slowly.	Moderate: seepage.	Severe: flooding.	Severe: flooding.	Fair: too clayey.
Bluecreek	Severe: cemented pan.	Severe: seepage, cemented pan.	Severe: cemented pan, seepage, too sandy.	Severe: cemented pan, seepage.	Poor: area reclaim, seepage, too sandy.

See footnote at end of table.

TABLE 11.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
14*:					
Dranyon	Severe: percs slowly, slope.	Severe: seepage, slope.	Severe: depth to rock, slope.	Severe: seepage, slope.	Poor: large stones, slope.
Strickland	Severe: depth to rock.	Severe: depth to rock, slope.	Severe: depth to rock.	Severe: depth to rock.	Poor: area reclaim, large stones.
Parkay	Severe: percs slowly, slope, large stones.	Severe: slope, large stones.	Severe: depth to rock, slope, large stones.	Severe: slope.	Poor: large stones, slope.
15*:					
Haploxeralfs.					
Durixeralfs.					
Rubble land.					
16 Hayspur	Severe: flooding, ponding, percs slowly.	Severe: seepage, ponding.	Severe: flooding, seepage, ponding.	Severe: flooding, ponding.	Poor: ponding.
17*:					
Hayspur	Severe: flooding, ponding, percs slowly.	Severe: seepage, ponding.	Severe: flooding, seepage, ponding.	Severe: flooding, ponding.	Poor: ponding.
Blackfoot	Severe: wetness, percs slowly.	Severe: wetness.	Severe: seepage, wetness.	Severe: wetness.	Fair: too clayey, wetness.
18*:					
Hayspur	Severe: flooding, ponding, percs slowly.	Severe: seepage, ponding.	Severe: flooding, seepage, ponding.	Severe: flooding, ponding.	Poor: ponding.
Zola	Severe: flooding, wetness, percs slowly.	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Fair: wetness.
Paynecreek	Severe: percs slowly.	Severe: seepage.	Severe: seepage.	Severe: seepage.	Poor: small stones.
19*:					
Lasauses Variant	Severe: ponding, percs slowly.	Severe: ponding.	Severe: ponding, too clayey.	Severe: ponding.	Poor: too clayey, hard to pack, ponding.
Boulder Lake	Severe: ponding, percs slowly.	Severe: ponding.	Severe: ponding, too clayey.	Severe: ponding.	Poor: too clayey, hard to pack, ponding.
20*:					
Moonstone	Severe: depth to rock, slope.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage, slope.	Severe: depth to rock, seepage, slope.	Poor: area reclaim, slope.

See footnote at end of table.

TABLE 11.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
20*:					
Earcree	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Poor: small stones, slope.
21*:					
Parkay	Severe: percs slowly, slope, large stones.	Severe: slope, large stones.	Severe: depth to rock, slope, large stones.	Severe: slope.	Poor: large stones, slope.
Dranyon	Severe: percs slowly, slope.	Severe: seepage, slope.	Severe: depth to rock, slope.	Severe: seepage, slope.	Poor: large stones, slope.
Cavanaugh	Severe: depth to rock, percs slowly, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope, too clayey.	Severe: depth to rock, slope.	Poor: area reclaim, too clayey, hard to pack.
22*:					
Parkay	Severe: percs slowly, slope, large stones.	Severe: slope, large stones.	Severe: depth to rock, slope, large stones.	Severe: slope.	Poor: large stones, slope.
Wickahoney	Severe: depth to rock, slope, large stones.	Severe: depth to rock, slope, large stones.	Severe: depth to rock, slope, too clayey.	Severe: depth to rock, slope.	Poor: area reclaim, too clayey, hard to pack.
Boulder Lake	Severe: flooding, wetness, percs slowly.	Severe: wetness.	Severe: flooding, wetness, too clayey.	Severe: flooding.	Poor: too clayey, hard to pack.
23 Paynecreek	Severe: percs slowly.	Severe: seepage.	Severe: seepage.	Severe: seepage.	Poor: small stones.
24 Paynecreek	Severe: percs slowly.	Severe: seepage, slope.	Severe: seepage.	Severe: seepage.	Poor: small stones.
25*:					
Paynecreek	Severe: percs slowly.	Severe: seepage.	Severe: seepage.	Severe: seepage.	Poor: small stones.
Thacker	Severe: cemented pan, poor filter.	Severe: seepage, cemented pan.	Severe: seepage, too sandy.	Severe: cemented pan, seepage.	Poor: area reclaim, seepage, too sandy.
26*:					
Petan	Severe: depth to rock, cemented pan, large stones.	Severe: depth to rock, cemented pan.	Severe: depth to rock, too clayey, large stones.	Severe: depth to rock, cemented pan.	Poor: area reclaim, too clayey, hard to pack.
Deunah	Severe: depth to rock, cemented pan.	Severe: depth to rock, cemented pan.	Severe: depth to rock, cemented pan, too clayey.	Severe: depth to rock, cemented pan.	Poor: area reclaim, too clayey, hard to pack.
Hatpeak	Severe: cemented pan, percs slowly.	Severe: cemented pan.	Severe: depth to rock, cemented pan, too clayey.	Severe: cemented pan.	Poor: area reclaim, too clayey, hard to pack.

See footnote at end of table.

TABLE 11.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
27*: Rubble land.					
Deunah	Severe: depth to rock, cemented pan.	Severe: depth to rock, cemented pan.	Severe: depth to rock, cemented pan, too clayey.	Severe: depth to rock, cemented pan.	Poor: area reclaim, too clayey, hard to pack.
28*: Rubble land.					
Rock outcrop.					
Argixerolls.					
29*: Searla	Severe: percs slowly, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: small stones, slope.
Povey	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope, large stones.	Severe: slope.	Poor: small stones, slope.
30--- Simonton	Moderate: percs slowly.	Severe: seepage.	Moderate: too sandy.	Severe: seepage.	Poor: small stones.
31*: Simonton	Moderate: percs slowly.	Severe: seepage.	Moderate: too sandy.	Severe: seepage.	Poor: small stones.
Bluecreek	Severe: cemented pan.	Severe: seepage, cemented pan.	Severe: cemented pan, seepage, too sandy.	Severe: cemented pan, seepage.	Poor: area reclaim, seepage, too sandy.
32*, 33*: Simonton	Moderate: percs slowly.	Severe: seepage.	Moderate: too sandy.	Severe: seepage.	Poor: small stones.
Thacker	Severe: cemented pan, poor filter.	Severe: seepage, cemented pan.	Severe: seepage, too sandy.	Severe: cemented pan, seepage.	Poor: area reclaim, seepage, too sandy.
34--- Soonahbe	Severe: percs slowly.	Moderate: seepage, cemented pan, slope.	Severe: cemented pan, seepage.	Moderate: cemented pan.	Fair: area reclaim, too clayey, thin layer.
35*: Soonahbe	Severe: percs slowly.	Moderate: seepage, cemented pan, slope.	Severe: cemented pan, seepage.	Moderate: cemented pan.	Fair: area reclaim, too clayey, thin layer.
Thacker	Severe: cemented pan, poor filter.	Severe: seepage, cemented pan.	Severe: seepage, too sandy.	Severe: cemented pan, seepage.	Poor: area reclaim, seepage, too sandy.
36*: Soonahbe Variant	Severe: depth to rock.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage.	Severe: depth to rock, seepage.	Poor: area reclaim.

See footnote at end of table.

TABLE 11.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
36*: Bulake	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock, too clayey.	Severe: depth to rock.	Poor: area reclaim, too clayey, hard to pack.
37*: Strickland	Severe: depth to rock.	Severe: depth to rock, slope.	Severe: depth to rock.	Severe: depth to rock.	Poor: area reclaim, large stones.
Bluebell	Severe: depth to rock, percs slowly.	Severe: depth to rock, slope.	Severe: depth to rock.	Severe: depth to rock.	Poor: area reclaim.
38, 39--- Thacker	Severe: cemented pan, poor filter.	Severe: seepage, cemented pan.	Severe: seepage, too sandy.	Severe: cemented pan, seepage.	Poor: area reclaim, seepage, too sandy.
40*, 41*: Thacker	Severe: cemented pan, poor filter.	Severe: seepage, cemented pan.	Severe: seepage, too sandy.	Severe: cemented pan, seepage.	Poor: area reclaim, seepage, too sandy.
Simonton	Moderate: percs slowly.	Severe: seepage.	Moderate: too sandy.	Severe: seepage.	Poor: small stones.
42*: Thacker	Severe: cemented pan, poor filter.	Severe: seepage, cemented pan.	Severe: seepage, too sandy.	Severe: cemented pan, seepage.	Poor: area reclaim, seepage, too sandy.
Soonahbe	Severe: percs slowly.	Moderate: seepage, cemented pan, slope.	Severe: cemented pan, seepage.	Moderate: cemented pan.	Fair: area reclaim, too clayey, thin layer.
43*: Thacker	Severe: cemented pan, poor filter.	Severe: seepage, cemented pan.	Severe: seepage, too sandy.	Severe: cemented pan, seepage.	Poor: area reclaim, seepage, too sandy.
Yatahoney	Severe: depth to rock, cemented pan, percs slowly.	Severe: depth to rock, cemented pan.	Severe: depth to rock, cemented pan.	Severe: depth to rock, cemented pan.	Poor: area reclaim.
44--- Tucker	Severe: flooding, wetness, percs slowly.	Severe: wetness.	Severe: flooding, wetness, too clayey.	Severe: flooding, wetness.	Poor: too clayey, hard to pack.
45--- Tucker	Severe: flooding, wetness, percs slowly.	Severe: seepage, wetness.	Severe: flooding, seepage, wetness.	Severe: flooding, wetness.	Poor: thin layer.
46--- Tucker Variant	Severe: flooding, wetness, percs slowly.	Severe: seepage, wetness.	Severe: flooding, seepage, wetness.	Severe: flooding, seepage, wetness.	Poor: seepage, too sandy, small stones.

See footnote at end of table.

TABLE 11.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
47*:					
Watchabob	Severe: depth to rock, poor filter, slope.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage, slope.	Severe: depth to rock, seepage, slope.	Poor: area reclaim, slope.
Bearskin Variant	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Poor: area reclaim, small stones, slope.
48 Wickahoney	Severe: depth to rock.	Severe: depth to rock, slope, large stones.	Severe: depth to rock, too clayey.	Severe: depth to rock.	Poor: area reclaim, too clayey, hard to pack.
49*:					
Wickahoney	Severe: depth to rock, slope, large stones.	Severe: depth to rock, slope, large stones.	Severe: depth to rock, slope, too clayey.	Severe: depth to rock, slope.	Poor: area reclaim, too clayey, hard to pack.
Blackleg	Severe: cemented pan, percs slowly, slope.	Severe: cemented pan, slope.	Severe: cemented pan, slope, too clayey.	Severe: cemented pan, slope.	Poor: area reclaim, too clayey, hard to pack.
50*:					
Wickahoney	Severe: depth to rock, large stones.	Severe: depth to rock, large stones.	Severe: depth to rock, too clayey.	Severe: depth to rock.	Poor: area reclaim, too clayey, hard to pack.
Wagonbox	Severe: depth to rock, cemented pan, large stones.	Severe: depth to rock, cemented pan.	Severe: depth to rock, too clayey, large stones.	Severe: depth to rock, cemented pan.	Poor: area reclaim, too clayey, hard to pack.
51*:					
Yatahoney	Severe: depth to rock, cemented pan, percs slowly.	Severe: depth to rock, cemented pan, slope.	Severe: depth to rock, cemented pan.	Severe: depth to rock, cemented pan.	Poor: area reclaim.
Blackleg	Severe: cemented pan, percs slowly.	Severe: cemented pan, slope, large stones.	Severe: cemented pan, too clayey.	Severe: cemented pan.	Poor: area reclaim, too clayey, hard to pack.
52*:					
Yatahoney	Severe: depth to rock, cemented pan, percs slowly.	Severe: depth to rock, cemented pan.	Severe: depth to rock, cemented pan.	Severe: depth to rock, cemented pan.	Poor: area reclaim.
Soonahbe	Severe: percs slowly.	Moderate: seepage, cemented pan, slope.	Severe: cemented pan, seepage.	Moderate: cemented pan.	Fair: area reclaim, too clayey, thin layer.
53 Zola	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Fair: wetness.
54 Zola	Severe: flooding, wetness, percs slowly.	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Fair: wetness.

See footnote at end of table.

TABLE 11.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
55*:					
Zola	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Fair: wetness.
Hayspur	Severe: flooding, ponding, percs slowly.	Severe: seepage, ponding.	Severe: flooding, seepage, ponding.	Severe: flooding, ponding.	Poor: ponding.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 12.--CONSTRUCTION MATERIALS

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "good," "fair," and other terms. Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation]

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
1*:				
Bedstead	Poor: area reclaim, low strength, large stones.	Improbable: excess fines, large stones.	Improbable: excess fines, large stones.	Poor: large stones.
Arbidge	Good	Improbable: small stones.	Probable	Poor: small stones, area reclaim.
2*:				
Blackfoot	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
Tucker	Fair: wetness.	Probable	Improbable: too sandy.	Poor: thin layer.
3*:				
Bluecreek	Poor: area reclaim.	Probable	Probable	Poor: small stones, area reclaim.
Thacker	Good	Probable	Probable	Poor: small stones, area reclaim.
4*:				
Bluecreek Variant	Good	Probable	Probable	Poor: small stones, area reclaim.
Paynecreek Variant	Good	Probable	Probable	Poor: area reclaim.
5*:				
Boulder Lake	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
Tucker	Fair: wetness.	Probable	Improbable: too sandy.	Poor: thin layer.
6*:				
Bulake	Poor: area reclaim, low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones.
Deunah	Poor: area reclaim, low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
7*:				
Burmah Variant	Fair: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
Torney Variant	Fair: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.

See footnote at end of table.

TABLE 12.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
7*:				
Yatahoney	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
8*:				
Cavanaugh	Poor: area reclaim, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
Obray	Poor: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, small stones.
9*:				
Cavanaugh	Poor: area reclaim, low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
Sattley	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
10*:				
Crooked Creek	Poor: low strength, wetness, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer, wetness.
Bear Lake	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
11--- Deunah	Poor: area reclaim, low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
12--- Disabel Variant	Fair: shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
13*:				
Disabel Variant	Fair: shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
Bluecreek	Poor: area reclaim.	Probable	Probable	Poor: small stones, area reclaim.
14*:				
Dranyon	Fair: area reclaim, thin layer, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
Strickland	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: large stones.
Parkay	Poor: large stones.	Improbable: excess fines, large stones.	Improbable: excess fines, large stones.	Poor: area reclaim, small stones, slope.
15*: Haploxeralfs. Durixeralfs.				

See footnote at end of table.

TABLE 12.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
15*: Rubble land.				
16---------- Hayspur	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
17*: Hayspur----------	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
Blackfoot----------	Fair: wetness.	Probable----------	Probable----------	Good.
18*: Hayspur----------	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
Zola----------	Fair: low strength, thin layer, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Good.
Paynecreek----------	Good----------	Probable----------	Probable----------	Poor: small stones, area reclaim.
19*: Lasauses Variant-----	Poor: low strength, wetness, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
Boulder Lake---------	Poor: low strength, wetness, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
20*: Moonstone----------	Poor: area reclaim, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
Earcree----------	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
21*: Parkay----------	Poor: large stones, slope.	Improbable: excess fines, large stones.	Improbable: excess fines, large stones.	Poor: area reclaim, small stones, slope.
Dranyon----------	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
Cavanaugh----------	Poor: area reclaim, low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
22*: Parkay----------	Poor: large stones.	Improbable: excess fines, large stones.	Improbable: excess fines, large stones.	Poor: area reclaim, small stones, slope.

See footnote at end of table.

TABLE 12.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
22*:				
Wickahoney	Poor: area reclaim, low strength, large stones.	Improbable: excess fines, large stones.	Improbable: excess fines, large stones.	Poor: area reclaim, large stones, slope.
Boulder Lake	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
23, 24---- Paynecreek	Good	Probable	Probable	Poor: small stones, area reclaim.
25*:				
Paynecreek	Good	Probable	Probable	Poor: small stones, area reclaim.
Thacker	Good	Probable	Probable	Poor: small stones, area reclaim.
26*:				
Petan	Poor: area reclaim, low strength, large stones.	Improbable: excess fines, large stones.	Improbable: excess fines, large stones.	Poor: area reclaim, large stones.
Deunah	Poor: area reclaim, low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
Hatpeak	Poor: area reclaim, low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Fair: area reclaim, large stones, thin layer.
27*:				
Rubble land.				
Deunah	Poor: area reclaim, low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
28*:				
Rubble land.				
Rock outcrop.				
Argixerolls.				
29*:				
Searla	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
Povey	Poor: slope.	Improbable: excess fines, large stones.	Improbable: excess fines, large stones.	Poor: small stones, area reclaim, slope.
30---- Simonton	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.

See footnote at end of table.

TABLE 12.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
31*:				
Simonton	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
Bluecreek	Poor: area reclaim.	Probable	Probable	Poor: small stones, area reclaim.
32*, 33*:				
Simonton	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
Thacker	Good	Probable	Probable	Poor: small stones, area reclaim.
34 Soonahbe	Fair: area reclaim.	Probable	Improbable: too sandy.	Good.
35*:				
Soonahbe	Fair: area reclaim.	Probable	Improbable: too sandy.	Good.
Thacker	Good	Probable	Probable	Poor: small stones, area reclaim.
36*:				
Soonahbe Variant	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
Bulake	Poor: area reclaim, low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones.
37*:				
Strickland	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: large stones.
Bluebell	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: large stones.
38, 39 Thacker	Good	Probable	Probable	Poor: small stones, area reclaim.
40*, 41*:				
Thacker	Good	Probable	Probable	Poor: small stones, area reclaim.
Simonton	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
42*:				
Thacker	Good	Probable	Probable	Poor: small stones, area reclaim.
Soonahbe	Fair: area reclaim.	Probable	Improbable: too sandy.	Good.

See footnote at end of table.

TABLE 12.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
43*:				
Thacker	Good	Probable	Probable	Poor: small stones, area reclaim.
Yatahoney	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
44 Tucker	Poor: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
45 Tucker	Fair: wetness.	Probable	Improbable: too sandy.	Poor: thin layer.
46 Tucker Variant	Fair: wetness.	Probable	Probable	Poor: area reclaim.
47*:				
Watchabob	Poor: area reclaim, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
Bearskin Variant	Poor: area reclaim, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones, slope.
48 Wickahoney	Poor: area reclaim, low strength.	Improbable: excess fines, large stones.	Improbable: excess fines, large stones.	Poor: area reclaim, large stones.
49*:				
Wickahoney	Poor: area reclaim, low strength, large stones.	Improbable: excess fines, large stones.	Improbable: excess fines, large stones.	Poor: area reclaim, large stones, slope.
Blackleg	Poor: area reclaim, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: large stones, slope.
50*:				
Wickahoney	Poor: area reclaim, low strength, large stones.	Improbable: excess fines, large stones.	Improbable: excess fines, large stones.	Poor: area reclaim, large stones.
Wagonbox	Poor: area reclaim, low strength, large stones.	Improbable: excess fines, large stones.	Improbable: excess fines, large stones.	Poor: area reclaim, large stones.
51*:				
Yatahoney	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
Blackleg	Poor: area reclaim, low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: large stones.
52*:				
Yatahoney	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
Soonahbe	Fair: area reclaim.	Probable	Improbable: too sandy.	Good.

See footnote at end of table.

TABLE 12.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
53, 54---------- Zola	Fair: low strength, thin layer, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Good.
55*: Zola----------	Fair: low strength, thin layer, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Good.
Hayspur----------	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 13.--WATER MANAGEMENT

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not evaluated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation]

Soil name and map symbol	Limitations for--			Features affecting--		
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Grassed waterways
1*:						
Bedstead	Severe: slope.	Severe: large stones.	Severe: no water.	Deep to water	Large stones, droughty, percs slowly.	Large stones, slope, droughty.
Arbidge	Moderate: seepage, cemented pan, slope.	Severe: seepage.	Severe: no water.	Deep to water	Cemented pan, slope.	Erodes easily, cemented pan.
2*:						
Blackfoot	Moderate: seepage.	Severe: piping.	Moderate: deep to water, slow refill.	Frost action	Wetness	Favorable.
Tucker	Moderate: seepage.	Severe: wetness.	Severe: slow refill.	Percs slowly, flooding, frost action.	Wetness, percs slowly, erodes easily.	Erodes easily, percs slowly.
3*:						
Bluecreek	Severe: seepage.	Severe: seepage.	Severe: no water.	Deep to water	Soil blowing, percs slowly, cemented pan.	Cemented pan, percs slowly.
Thacker	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Percs slowly, cemented pan.	Erodes easily, cemented pan.
4*:						
Bluecreek Variant	Severe: seepage.	Severe: seepage.	Severe: slow refill, cutbanks cave.	Deep to water	Droughty, percs slowly, erodes easily.	Excess salt, erodes easily, droughty.
Paynecreek Variant	Severe: seepage.	Severe: seepage.	Severe: no water.	Deep to water	Favorable	Erodes easily.
5*:						
Boulder Lake	Slight	Severe: hard to pack.	Severe: no water.	Percs slowly, flooding.	Wetness, slow intake, percs slowly.	Percs slowly.
Tucker	Moderate: seepage.	Severe: wetness.	Severe: slow refill.	Percs slowly, flooding, frost action.	Wetness, percs slowly, erodes easily.	Erodes easily, percs slowly.
6*:						
Bulake	Severe: depth to rock, slope.	Severe: thin layer.	Severe: no water.	Deep to water	Percs slowly, depth to rock.	Slope, depth to rock.
Deunah	Moderate: depth to rock, cemented pan, slope.	Severe: hard to pack.	Severe: no water.	Deep to water	Percs slowly, depth to rock, cemented pan.	Large stones, erodes easily.
7*:						
Burmah Variant	Slight	Severe: hard to pack.	Severe: no water.	Deep to water	Percs slowly, erodes easily.	Erodes easily, percs slowly.
Torney Variant	Moderate: seepage.	Moderate: thin layer, piping.	Severe: no water.	Deep to water	Percs slowly, erodes easily.	Erodes easily, percs slowly.

See footnote at end of table.

TABLE 13.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--			Features affecting--		
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Grassed waterways
7*:						
Yatahoney	Moderate: depth to rock, cemented pan.	Severe: piping.	Severe: no water.	Deep to water	Percs slowly, depth to rock, cemented pan.	Large stones, depth to rock.
8*:						
Cavanaugh	Severe: slope.	Severe: thin layer.	Severe: no water.	Deep to water	Large stones, percs slowly, depth to rock.	Large stones, slope, depth to rock.
Obray	Severe: slope.	Severe: hard to pack.	Severe: no water.	Deep to water	Slow intake, percs slowly, slope.	Slope, percs slowly.
9*:						
Cavanaugh	Severe: slope.	Severe: thin layer.	Severe: no water.	Deep to water	Large stones, percs slowly, depth to rock.	Large stones, slope, depth to rock.
Sattley	Severe: slope.	Severe: large stones.	Severe: no water.	Deep to water	Large stones, droughty, slope.	Large stones, slope, droughty.
10*:						
Crooked Creek	Slight	Severe: piping, ponding.	Severe: slow refill.	Ponding, percs slowly, frost action.	Ponding, percs slowly, erodes easily.	Wetness, erodes easily, percs slowly.
Bear Lake	Slight	Severe: piping, ponding.	Severe: slow refill.	Ponding, frost action.	Ponding, percs slowly, erodes easily.	Wetness, erodes easily.
11--- Deunah	Moderate: depth to rock, cemented pan.	Severe: hard to pack.	Severe: no water.	Deep to water	Percs slowly, depth to rock, cemented pan.	Large stones, erodes easily.
12--- Disabel Variant	Moderate: seepage.	Moderate: thin layer, piping.	Severe: no water.	Deep to water	Percs slowly, erodes easily, flooding.	Erodes easily, percs slowly.
13*:						
Disabel Variant--	Moderate: seepage.	Moderate: thin layer, piping.	Severe: no water.	Deep to water	Percs slowly, erodes easily, flooding.	Erodes easily, percs slowly.
Bluecreek	Severe: seepage.	Severe: seepage.	Severe: no water.	Deep to water	Soil blowing, percs slowly, cemented pan.	Cemented pan, percs slowly.
14*:						
Dranyon	Severe: slope.	Moderate: thin layer, piping, large stones.	Severe: no water.	Deep to water	Soil blowing, slope.	Large stones, slope.
Strickland	Severe: slope.	Severe: piping.	Severe: no water.	Deep to water	Large stones, depth to rock, slope.	Large stones, slope, depth to rock.
Parkay	Severe: slope.	Severe: large stones.	Severe: no water.	Deep to water	Large stones, droughty, slope.	Large stones, slope, droughty.
15*:						
Haploxeralfs.						
Durixeralfs.						
Rubble land.						

See footnote at end of table.

TABLE 13.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--			Features affecting--		
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Grassed waterways
16---------- Hayspur	Moderate: seepage.	Severe: ponding.	Severe: slow refill, cutbanks cave.	Ponding, flooding, frost action.	Ponding, erodes easily, flooding.	Wetness, erodes easily.
17*: Hayspur----------	Moderate: seepage.	Severe: ponding.	Severe: slow refill, cutbanks cave.	Ponding, flooding, frost action.	Ponding, erodes easily, flooding.	Wetness, erodes easily.
Blackfoot--------	Moderate: seepage.	Severe: piping.	Severe: slow refill.	Frost action---	Wetness, erodes easily.	Erodes easily.
18*: Hayspur----------	Moderate: seepage.	Severe: ponding.	Severe: slow refill, cutbanks cave.	Ponding, flooding, frost action.	Ponding, erodes easily, flooding.	Wetness, erodes easily.
Zola----------	Moderate: seepage.	Moderate: thin layer, piping, wetness.	Severe: slow refill.	Deep to water	Flooding-------	Erodes easily.
Paynecreek--------	Severe: seepage.	Severe: seepage.	Severe: no water.	Deep to water	Favorable------	Favorable.
19*: Lasauses Variant-	Slight---------	Severe: hard to pack, ponding.	Severe: slow refill.	Ponding, percs slowly, frost action.	Ponding, slow intake, percs slowly.	Wetness, percs slowly.
Boulder Lake-----	Slight---------	Severe: hard to pack, ponding.	Severe: slow refill.	Ponding, percs slowly.	Ponding, slow intake, percs slowly.	Wetness, percs slowly.
20*: Moonstone--------	Severe: seepage, slope.	Moderate: thin layer, seepage, piping.	Severe: no water.	Deep to water	Droughty, depth to rock, slope.	Slope, droughty, depth to rock.
Earcree----------	Severe: seepage, slope.	Severe: seepage.	Severe: no water.	Deep to water	Droughty, soil blowing, slope.	Slope, droughty.
21*: Parkay----------	Severe: slope.	Severe: large stones.	Severe: no water.	Deep to water	Large stones, droughty, slope.	Large stones, slope, droughty.
Dranyon----------	Severe: slope.	Moderate: thin layer, piping, large stones.	Severe: no water.	Deep to water	Soil blowing, slope.	Large stones, slope.
Cavanaugh--------	Severe: slope.	Severe: thin layer.	Severe: no water.	Deep to water	Large stones, percs slowly, depth to rock.	Large stones, slope, depth to rock.
22*: Parkay----------	Severe: slope.	Severe: large stones.	Severe: no water.	Deep to water	Large stones, droughty, slope.	Large stones, slope, droughty.
Wickahoney-------	Severe: depth to rock, slope.	Severe: large stones.	Severe: no water.	Deep to water	Large stones, percs slowly, depth to rock.	Large stones, slope, depth to rock.
Boulder Lake-----	Slight---------	Severe: hard to pack.	Severe: no water.	Percs slowly, flooding.	Wetness, slow intake, percs slowly.	Percs slowly.

TABLE 13.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--			Features affecting--		
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Grassed waterways
23---------- Paynecreek	Severe: seepage.	Severe: seepage.	Severe: no water.	Deep to water	Favorable------	Favorable.
24---------- Paynecreek	Severe: seepage, slope.	Severe: seepage.	Severe: no water.	Deep to water	Slope----------	Slope.
25*:						
Paynecreek-------	Severe: seepage.	Severe: seepage.	Severe: no water.	Deep to water	Slope----------	Favorable.
Thacker----------	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Percs slowly, cemented pan, slope.	Erodes easily, cemented pan.
26*:						
Petan----------	Severe: depth to rock, cemented pan.	Severe: large stones.	Severe: no water.	Deep to water	Large stones, droughty, percs slowly.	Large stones, droughty.
Deunah----------	Moderate: depth to rock, cemented pan.	Severe: hard to pack.	Severe: no water.	Deep to water	Percs slowly, depth to rock, cemented pan.	Large stones, erodes easily.
Hatpeak----------	Moderate: depth to rock, cemented pan.	Severe: thin layer.	Severe: no water.	Deep to water	Percs slowly, cemented pan.	Erodes easily, cemented pan, percs slowly.
27*:						
Rubble land.						
Deunah----------	Moderate: depth to rock, cemented pan.	Severe: hard to pack.	Severe: no water.	Deep to water	Percs slowly, depth to rock, cemented pan.	Large stones, erodes easily.
28*:						
Rubble land.						
Rock outcrop.						
Argixerolls.						
29*:						
Searla----------	Severe: slope.	Slight---------	Severe: no water.	Deep to water	Slope----------	Slope.
Povey----------	Severe: slope.	Severe: large stones.	Severe: no water.	Deep to water	Large stones, droughty, slope.	Large stones, slope, droughty.
30---------- Simonton	Moderate: seepage.	Severe: seepage.	Severe: no water.	Deep to water	Soil blowing---	Favorable.
31*:						
Simonton---------	Moderate: seepage.	Severe: seepage.	Severe: no water.	Deep to water	Soil blowing---	Favorable.
Bluecreek--------	Severe: seepage.	Severe: seepage.	Severe: no water.	Deep to water	Soil blowing, percs slowly, cemented pan.	Cemented pan, percs slowly.
32*:						
Simonton---------	Moderate: seepage.	Severe: seepage.	Severe: no water.	Deep to water	Soil blowing---	Favorable.
Thacker----------	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Percs slowly, cemented pan.	Erodes easily, cemented pan.

See footnote at end of table.

TABLE 13.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--			Features affecting--		
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Grassed waterways
33*:						
Simonton	Moderate: seepage, slope.	Severe: seepage.	Severe: no water.	Deep to water	Soil blowing, slope.	Favorable.
Thacker	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Percs slowly, cemented pan, slope.	Erodes easily, cemented pan.
34--- Soonahbe	Moderate: seepage, cemented pan.	Severe: thin layer.	Severe: no water.	Deep to water	Erodes easily	Erodes easily.
35*:						
Soonahbe	Moderate: seepage, cemented pan.	Severe: thin layer.	Severe: no water.	Deep to water	Erodes easily	Erodes easily.
Thacker	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Percs slowly, cemented pan.	Erodes easily, cemented pan.
36*:						
Soonahbe Variant-	Severe: seepage, slope.	Severe: piping.	Severe: no water.	Deep to water	Soil blowing, depth to rock, slope.	Slope, erodes easily, depth to rock.
Bulake	Severe: depth to rock.	Severe: thin layer.	Severe: no water.	Deep to water	Soil blowing, percs slowly, depth to rock.	Erodes easily, depth to rock.
37*:						
Strickland	Severe: slope.	Severe: piping.	Severe: no water.	Deep to water	Large stones, depth to rock, slope.	Large stones, slope, depth to rock.
Bluebell	Severe: slope.	Severe: piping.	Severe: no water.	Deep to water	Large stones, depth to rock, slope.	Large stones, slope, depth to rock.
38--- Thacker	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Percs slowly, cemented pan.	Erodes easily, cemented pan.
39--- Thacker	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Percs slowly, cemented pan, slope.	Cemented pan.
40*:						
Thacker	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Percs slowly, cemented pan.	Erodes easily, cemented pan.
Simonton	Moderate: seepage.	Severe: seepage.	Severe: no water.	Deep to water	Soil blowing---	Favorable.
41*:						
Thacker	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Percs slowly, cemented pan, slope.	Erodes easily, cemented pan.
Simonton	Moderate: seepage, slope.	Severe: seepage.	Severe: no water.	Deep to water	Soil blowing, slope.	Favorable.
42*:						
Thacker	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Percs slowly, cemented pan, slope.	Erodes easily, cemented pan.

See footnote at end of table.

TABLE 13.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--			Features affecting--		
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Grassed waterways
42*:						
Soonahbe	Moderate: seepage, cemented pan, slope.	Severe: thin layer.	Severe: no water.	Deep to water	Slope, erodes easily.	Erodes easily.
43*:						
Thacker	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Percs slowly, cemented pan, slope.	Erodes easily, cemented pan.
Yatahoney	Moderate: depth to rock, cemented pan, slope.	Severe: piping.	Severe: no water.	Deep to water	Percs slowly, depth to rock, cemented pan.	Depth to rock.
44 Tucker	Slight	Severe: wetness.	Severe: slow refill.	Percs slowly, flooding, frost action.	Wetness, percs slowly, erodes easily.	Erodes easily, percs slowly.
45 Tucker	Moderate: seepage.	Severe: wetness.	Severe: slow refill.	Percs slowly, flooding, frost action.	Wetness, percs slowly, erodes easily.	Erodes easily, percs slowly.
46 Tucker Variant	Severe: seepage.	Severe: seepage, wetness.	Severe: slow refill, cutbanks cave.	Percs slowly, flooding, cutbanks cave.	Wetness, percs slowly, erodes easily.	Erodes easily, percs slowly.
47*:						
Watchabob	Severe: seepage, slope.	Severe: thin layer.	Severe: no water.	Deep to water	Droughty, soil blowing, depth to rock.	Slope, droughty, depth to rock.
Bearskin Variant	Severe: depth to rock, slope.	Severe: thin layer.	Severe: no water.	Deep to water	Depth to rock, slope.	Slope, depth to rock.
48 Wickahoney	Severe: depth to rock, slope.	Severe: large stones.	Severe: no water.	Deep to water	Large stones, percs slowly, depth to rock.	Large stones, slope, depth to rock.
49*:						
Wickahoney	Severe: depth to rock, slope.	Severe: large stones.	Severe: no water.	Deep to water	Large stones, percs slowly, depth to rock.	Large stones, slope, depth to rock.
Blackleg	Severe: slope.	Severe: hard to pack, large stones.	Severe: no water.	Deep to water	Large stones, percs slowly, cemented pan.	Large stones, slope, cemented pan.
50*:						
Wickahoney	Severe: depth to rock.	Severe: large stones.	Severe: no water.	Deep to water	Large stones, percs slowly, depth to rock.	Large stones, depth to rock.
Wagonbox	Severe: depth to rock, cemented pan.	Severe: large stones.	Severe: no water.	Deep to water	Large stones, droughty, percs slowly.	Large stones, droughty, depth to rock.
51*:						
Yatahoney	Moderate: depth to rock, cemented pan, slope.	Severe: piping.	Severe: no water.	Deep to water	Percs slowly, depth to rock, cemented pan.	Large stones, depth to rock.
Blackleg	Severe: slope.	Severe: hard to pack, large stones.	Severe: no water.	Deep to water	Large stones, percs slowly, cemented pan.	Large stones, slope, cemented pan.

See footnote at end of table.

TABLE 13.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--			Features affecting--		
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Grassed waterways
52*:						
Yatahoney	Moderate: depth to rock, cemented pan, slope.	Severe: piping.	Severe: no water.	Deep to water	Percs slowly, depth to rock, cemented pan.	Depth to rock.
Soonahbe	Moderate: seepage, cemented pan, slope.	Severe: thin layer.	Severe: no water.	Deep to water	Slope, erodes easily.	Erodes easily.
53 Zola	Moderate: seepage.	Moderate: thin layer, piping, wetness.	Severe: slow refill.	Deep to water	Favorable	Erodes easily.
54 Zola	Moderate: seepage.	Moderate: thin layer, piping, wetness.	Severe: slow refill.	Deep to water	Flooding	Erodes easily.
55*:						
Zola	Moderate: seepage.	Moderate: thin layer, piping, wetness.	Severe: slow refill.	Deep to water	Favorable	Erodes easily.
Hayspur	Moderate: seepage.	Severe: ponding.	Severe: slow refill, cutbanks cave.	Ponding, flooding, frost action.	Ponding, erodes easily, flooding.	Wetness, erodes easily.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 14.--ENGINEERING INDEX PROPERTIES

[The symbol < means less than; > means more than. Absence of an entry indicates that data were not estimated]

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
1*:											
Bedstead--------	0-11	Extremely stony silt loam.	CL-ML, CL	A-4, A-6	30-45	85-95	80-90	75-85	60-75	20-35	5-15
	11-21	Very cobbly clay, extremely stony clay loam, extremely stony clay.	CL, CH	A-7	50-80	90-100	85-95	80-90	70-85	40-60	15-35
	21-22	Indurated--------	---	---	---	---	---	---	---	---	---
	22	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Arbidge---------	0-3	Silt loam--------	ML	A-4	0	85-100	80-100	70-95	55-80	20-35	NP-10
	3-19	Sandy clay loam, clay loam.	SC, CL	A-6	0	90-100	85-100	60-80	40-55	30-40	10-20
	19-30	Sandy loam, sandy clay loam, gravelly sandy loam, gravelly loam.	SM, GM	A-2, A-4, A-1	0-5	60-100	55-95	35-80	20-50	20-35	NP-10
	30-38	Indurated--------	---	---	---	---	---	---	---	---	---
	38-60	Extremely gravelly sand.	GP	A-1	0-15	20-30	10-25	5-15	0-5	---	NP
2*:											
Blackfoot-------	0-7	Silt loam--------	ML	A-4	0	95-100	95-100	80-90	75-85	20-35	NP-10
	7-34	Loam-------------	ML	A-4	0	95-100	95-100	65-75	55-70	20-35	NP-10
	34-45	Silty clay loam, silt loam.	CL	A-6	0	95-100	95-100	85-100	75-90	25-40	10-20
	45-65	Stratified fine sandy loam to silty clay loam.	CL-ML, CL	A-4, A-6	0	95-100	95-100	75-95	50-70	20-35	5-15
	65-84	Extremely gravelly coarse sand.	GP, SP	A-1	0	40-60	15-25	5-15	0-5	---	NP
Tucker----------	0-6	Silty clay loam	CL	A-6	0	100	95-100	90-100	85-95	35-40	15-20
	6-22	Silty clay loam, silty clay, clay.	CL, CH	A-7	0	100	95-100	90-100	80-95	40-55	20-35
	22-46	Clay loam, loam	CL	A-6	0	100	90-100	80-95	65-80	25-35	10-20
	46-84	Stratified very gravelly coarse sand to very gravelly sandy loam.	SP-SM, SM	A-1	0	75-85	35-50	25-35	5-15	---	NP
3*:											
Bluecreek-------	0-11	Sandy loam-------	SM, SM-SC	A-2, A-4	0	90-100	85-100	55-70	25-50	20-30	NP-10
	11-20	Clay, sandy clay, clay loam.	CH, CL, SC	A-6, A-7	0	85-100	80-100	70-100	40-85	30-55	10-30
	20-26	Gravelly sandy loam, sandy loam, gravelly sandy clay loam.	SM, SM-SC, SC	A-2, A-4, A-1, A-6	0	65-100	60-95	35-80	20-50	20-35	NP-15
	26-44	Cemented---------	---	---	---	---	---	---	---	---	---
	44-84	Gravelly loamy sand, very gravelly sand, sand.	SW	A-1	0	60-90	40-80	15-35	0-5	---	NP

See footnote at end of table.

TABLE 14.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
3*:											
Thacker	0-4	Loam	CL, CL-ML	A-4, A-6	0	95-100	85-100	75-100	60-90	20-35	5-15
	4-12	Gravelly loam, loam, clay loam.	CL, SC	A-6	0	80-100	70-100	60-100	45-80	25-40	10-20
	12-21	Clay	CL, CH	A-7	0	95-100	85-100	80-100	75-95	40-70	20-45
	21-30	Indurated	---	---	---	---	---	---	---	---	---
	30-84	Stratified sand to extremely gravelly sand.	GP, SP, GP-GM, SP-SM	A-1	0	40-100	30-100	15-60	0-10	---	NP
4*:											
Bluecreek Variant	0-7	Silt loam	ML	A-4	0	95-100	90-100	85-100	75-90	20-25	NP-5
	7-12	Clay	CL, CH	A-6, A-7	0	95-100	90-100	85-100	80-95	35-55	20-35
	12-21	Clay loam, loam	CL	A-6	0	95-100	90-100	80-95	65-75	25-40	10-25
	21-90	Stratified gravelly sand to extremely gravelly sand.	GP, SP, GP-GM, SP-SM	A-1	0	30-70	20-70	15-45	0-10	---	NP
Paynecreek Variant	0-12	Loam	CL-ML	A-4	0	90-100	80-100	70-90	55-70	20-30	5-10
	12-17	Sandy loam, loam	CL-ML, SM-SC	A-2, A-4	0	90-100	80-100	55-90	30-70	20-30	5-10
	17-35	Loam, clay loam	CL	A-6	0	95-100	85-100	75-100	60-80	30-40	10-20
	35-82	Very gravelly sand.	GP, SP	A-1	0	45-65	35-45	20-30	0-5	---	NP
5*:											
Boulder Lake	0-17	Clay	CH	A-7	0	100	100	90-100	80-95	60-70	45-55
	17-72	Clay, silty clay	CH	A-7	0	100	100	90-100	80-95	60-70	45-55
Tucker	0-6	Silty clay loam	CL	A-6	0	100	95-100	90-100	85-95	35-40	15-20
	6-22	Silty clay loam, silty clay, clay.	CL, CH	A-7	0	100	95-100	90-100	80-95	40-55	20-35
	22-46	Clay loam, loam	CL	A-6	0	100	90-100	80-95	65-80	25-35	10-20
	46-84	Stratified very gravelly coarse sand to very gravelly sandy loam.	SP-SM, SM	A-1	0	75-85	35-50	25-35	5-15	---	NP
6*:											
Bulake	0-4	Stony loam	CL-ML	A-4	5-15	90-100	85-95	80-90	60-70	20-30	5-10
	4-8	Gravelly loam, loam.	CL, CL-ML	A-4, A-6	0-10	80-95	70-85	70-75	50-60	20-30	5-15
	8-17	Clay	CL, CH	A-7	0-10	95-100	90-100	85-95	80-90	40-55	20-30
	17	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Deunah	0-9	Extremely stony loam.	CL-ML, CL	A-4, A-6	40-65	95-100	90-100	80-95	60-85	20-35	5-15
	9-14	Clay loam, cobbly clay loam.	CL-ML, CL	A-4, A-6	0-25	95-100	95-100	85-95	70-80	25-40	5-15
	14-20	Clay	CH	A-7	0-5	95-100	95-100	90-100	75-95	60-80	30-45
	20-26	Indurated	---	---	---	---	---	---	---	---	---
	26	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
7*:											
Burmah Variant	0-12	Silt loam	CL, CL-ML	A-4, A-6	0	95-100	95-100	85-95	75-90	20-35	5-15
	12-40	Clay	CL, CH	A-7	0	95-100	95-100	85-95	85-95	45-65	25-45
	40-60	Loam, clay loam	CL, ML	A-4, A-6, A-7	0	95-100	95-100	80-95	60-75	30-45	5-20

See footnote at end of table.

TABLE 14.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
7*:											
Torney Variant--	0-13	Silt loam--------	CL-ML, ML	A-4	0	100	100	90-100	85-95	25-35	5-10
	13-17	Silty clay loam	CL	A-6	0	100	100	95-100	85-95	30-40	10-15
	17-25	Clay, silty clay	CL, CH	A-7	0	100	100	95-100	85-95	45-55	20-30
	25-48	Silty clay loam	CL	A-6	0	100	100	95-100	85-95	30-40	10-15
	48-60	Silt loam--------	CL-ML, ML	A-4	0	100	100	95-100	85-95	25-35	5-10
Yatahoney-------	0-4	Very cobbly loam	CL-ML	A-4	10-55	95-100	90-100	80-90	60-75	25-30	5-10
	4-20	Clay-------------	CL, CH	A-7	0-5	95-100	90-100	85-100	70-90	40-60	20-40
	20-40	Indurated--------	---	---	---	---	---	---	---	---	---
	40	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
8*:											
Cavanaugh-------	0-5	Very stony loam	CL-ML, ML	A-4	10-20	90-100	85-95	75-85	60-70	25-35	5-10
	5-21	Cobbly clay loam, cobbly clay.	CH, CL	A-7	15-40	85-95	80-90	70-80	55-75	40-55	20-30
	21-32	Very cobbly clay, extremely cobbly clay loam, very cobbly clay loam, very gravelly clay loam.	GC, CH, CL	A-7	35-65	50-70	45-65	40-60	35-55	40-55	20-30
	32	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Obray-----------	0-4	Stony clay-------	CH	A-7	5-15	85-95	80-95	70-90	55-80	55-70	35-50
	4-35	Clay-------------	CH, MH	A-7	0-5	80-90	75-90	60-80	55-75	70-85	35-50
	35-61	Clay loam--------	CL	A-6, A-7	0-5	80-90	75-85	60-80	55-65	35-45	15-20
9*:											
Cavanaugh-------	0-5	Very stony loam	CL-ML, ML	A-4	10-20	90-100	85-95	75-85	60-70	25-35	5-10
	5-21	Cobbly clay loam, cobbly clay.	CH, CL	A-7	15-40	85-95	80-90	70-80	55-75	40-55	20-30
	21-32	Very cobbly clay, extremely cobbly clay loam, very cobbly clay loam, very gravelly clay loam.	GC, CH, CL	A-7	35-65	50-70	45-65	40-60	35-55	40-55	20-30
	32	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Sattley---------	0-4	Gravelly loam----	CL-ML, SM-SC	A-4	5-10	70-80	65-75	60-65	45-55	20-30	5-10
	4-31	Very gravelly loam, very gravelly clay loam.	GM-GC, GC	A-2, A-4, A-6	5-30	50-60	40-55	35-50	30-40	25-40	5-20
	31-43	Extremely cobbly loam.	GM-GC	A-2	55-65	35-55	25-45	20-40	15-30	25-30	5-10
	43	Weathered bedrock	---	---	---	---	---	---	---	---	---
10*:											
Crooked Creek---	0-4	Silt loam--------	CL-ML, ML	A-4	0	100	95-100	90-95	80-90	25-35	5-10
	4-25	Clay-------------	CL, CH	A-7	0	100	95-100	90-100	85-95	45-55	25-35
	25-84	Silt loam, silty clay loam.	CL-ML, CL	A-4, A-6	0	100	95-100	90-100	80-95	25-40	5-20
Bear Lake-------	0-9	Silt loam--------	CL-ML, ML	A-4	0	100	100	95-100	80-90	25-35	5-10
	9-45	Silt loam, silty clay loam.	CL-ML, CL	A-4, A-6	0	100	100	95-100	85-95	25-40	5-20
	45-60	Silty clay-------	CL, CH	A-7	0	100	100	95-100	85-95	45-55	25-35
11---------------	0-4	Stony silt loam	CL-ML, CL	A-4, A-6	5-20	95-100	95-100	85-100	70-90	20-35	5-15
Deunah	4-9	Silty clay loam, clay loam, silt loam.	CL	A-6	0-10	95-100	95-100	80-100	70-90	25-40	10-20
	9-19	Clay-------------	CH	A-7	0-10	95-100	95-100	90-100	85-95	60-80	30-45
	19-23	Loam, clay loam	CL-ML, CL	A-4, A-6	0-10	95-100	95-100	80-100	60-75	25-35	5-15
	23-28	Indurated--------	---	---	---	---	---	---	---	---	---
	28	Unweathered bedrock.	---	---	---	---	---	---	---	---	---

TABLE 14.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
12---------- Disabel Variant	0-7	Silt loam--------	ML	A-4	0	95-100	90-100	85-100	75-90	20-30	NP-5
	7-23	Clay------------	CL, CH	A-6, A-7	0	95-100	90-100	85-100	80-95	35-55	20-35
	23-42	Clay loam, loam	CL	A-6	0	95-100	90-100	80-90	65-75	25-40	10-25
	42-84	Fine sandy loam, loam.	CL, CL-ML	A-4, A-6	0	95-100	90-100	75-90	50-70	25-35	5-15
13*:											
Disabel Variant-	0-7	Silt loam--------	ML	A-4	0	95-100	90-100	85-100	75-90	20-30	NP-5
	7-23	Clay------------	CL, CH	A-6, A-7	0	95-100	90-100	85-100	80-95	35-55	20-35
	23-42	Clay loam, loam	CL	A-6	0	95-100	90-100	80-90	65-75	25-40	10-25
	42-84	Fine sandy loam, loam.	CL, CL-ML	A-4, A-6	0	95-100	90-100	75-90	50-70	25-35	5-15
Bluecreek-------	0-11	Sandy loam-------	SM, SM-SC	A-2, A-4	0	90-100	85-100	55-70	25-50	20-30	NP-10
	11-20	Clay, sandy clay, clay loam.	CH, CL, SC	A-6, A-7	0	85-100	80-100	70-100	40-85	30-55	10-30
	20-26	Gravelly sandy loam, sandy loam, gravelly sandy clay loam.	SM, SM-SC, SC	A-2, A-4, A-1, A-6	0	65-100	60-95	35-80	20-50	20-35	NP-15
	26-44	Cemented---------	---	---	---	---	---	---	---	---	---
	44-84	Gravelly loamy sand, very gravelly sand, sand.	SW	A-1	0	60-90	40-80	15-35	0-5	---	NP
14*:											
Dranyon---------	0-13	Loam------------	SM-SC, CL-ML	A-4	0-5	95-100	90-100	65-85	40-75	20-30	5-10
	13-36	Loam, gravelly sandy loam.	CL-ML	A-4	0-15	90-100	75-95	65-80	55-70	25-30	5-10
	36-53	Very cobbly clay loam.	GC	A-2	40-50	50-60	40-50	30-40	25-35	35-45	10-20
	53	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Strickland------	0-13	Loam------------	CL-ML	A-4	0-15	95-100	90-100	80-90	65-75	20-30	5-10
	13-28	Loam, cobbly loam	CL-ML, CL	A-4, A-6	5-40	85-95	80-90	60-80	50-65	25	5-15
	28-35	Weathered bedrock	---	---	---	---	---	---	---	---	---
Parkay----------	0-10	Stony loam-------	CL-ML	A-4	5-15	90-100	85-95	75-85	60-70	20-30	5-10
	10-19	Very cobbly loam	CL-ML, GM-GC	A-2, A-6	40-55	60-85	55-80	50-70	40-55	20-30	5-10
	19-45	Extremely cobbly clay loam, very cobbly clay loam.	GC	A-2	60-75	35-75	25-70	25-60	20-50	25-40	10-20
	45	Weathered bedrock	---	---	---	---	---	---	---	---	---
15*: Haploxeralfs. Durixeralfs. Rubble land.											
16---------- Hayspur	0-4	Clay loam--------	CL	A-6	0-5	95-100	90-100	80-95	65-80	30-40	15-25
	4-59	Stratified silty clay loam to loam.	CL	A-6	6.-8.	95-100	90-100	75-100	55-85	25-40	10-25
	59-84	Very gravelly loamy sand.	SM, GM	A-1	0-5	40-60	30-50	20-30	10-15	---	NP
17*:											
Hayspur---------	0-4	Clay loam--------	CL	A-6	0-5	95-100	90-100	80-95	65-80	30-40	15-25
	4-59	Stratified silty clay loam to loam.	CL	A-6	6.-8.	95-100	90-100	75-100	55-85	25-40	10-25
	59-84	Very gravelly loamy sand.	SM, GM	A-1	0-5	40-60	30-50	20-30	10-15	---	NP

TABLE 14.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
17*:											
Blackfoot-------	0-7	Silt loam--------	ML	A-4	0	95-100	95-100	80-90	75-85	20-35	NP-10
	7-34	Loam-------------	ML	A-4	0	95-100	95-100	65-75	55-70	20-35	NP-10
	34-45	Silty clay loam, silt loam.	CL	A-6	0	95-100	95-100	85-100	75-90	25-40	10-20
	45-65	Stratified fine sandy loam to silty clay loam.	CL-ML, CL	A-4, A-6	0	95-100	95-100	75-95	50-70	20-35	5-15
	65-84	Extremely gravelly coarse sand.	GP, SP	A-1	0	40-60	15-25	5-15	0-5	---	NP
18*:											
Hayspur---------	0-4	Clay loam--------	CL	A-6	0-5	95-100	90-100	80-95	65-80	30-40	15-25
	4-59	Stratified silty clay loam to loam.	CL	A-6	6.-8.	95-100	90-100	75-100	55-85	25-40	10-25
	59-84	Very gravelly loamy sand.	SM, GM	A-1	0-5	40-60	30-50	20-30	10-15	---	NP
Zola------------	0-16	Loam-------------	CL-ML, CL	A-4, A-6	0	100	100	85-95	65-75	25-35	5-15
	16-28	Silty clay loam	CL	A-6	0	100	100	95-100	80-90	35-40	20-25
	28-65	Loam-------------	CL	A-6	0	100	100	85-95	65-75	30-35	10-15
	65-73	Loamy coarse sand	SM	A-1	0	100	90-100	30-45	15-35	---	NP
	73-84	Clay loam--------	CL	A-6, A-7	0	100	100	80-95	70-80	35-45	20-30
Paynecreek------	0-12	Gravelly loam----	GM-GC, GM, SM-SC, SM	A-2, A-4	0	65-100	60-75	50-65	30-50	20-30	NP-10
	12-45	Sandy clay loam, gravelly sandy clay loam, gravelly clay loam.	SC, CL	A-6	0	75-100	70-100	60-90	35-55	30-40	10-20
	45-84	Very gravelly loamy coarse sand.	GP-GM, SP-SM, GM, SM	A-1	0-10	40-65	25-50	10-25	5-15	---	NP
19*:											
Lasauses Variant	0-66	Clay-------------	CH	A-7	0	100	100	95-100	85-100	60-80	30-45
Boulder Lake----	0-17	Clay-------------	CH	A-7	0	100	100	90-100	80-95	60-70	45-55
	17-72	Clay, silty clay	CH	A-7	0	100	100	90-100	80-95	60-70	45-55
20*:											
Moonstone-------	0-8	Gravelly coarse sandy loam.	SM	A-1, A-2	0-5	70-80	65-75	45-50	20-30	20-25	NP-5
	8-28	Coarse sandy loam, gravelly coarse sandy loam.	SM	A-1, A-2, A-4	0-5	70-95	65-90	45-70	20-50	20-25	NP-5
	28	Weathered bedrock	---	---	---	---	---	---	---	---	---
Earcree---------	0-6	Gravelly coarse sandy loam.	SM	A-1, A-2	0-15	75-95	65-75	35-45	20-35	20-25	NP-5
	6-64	Very gravelly loamy coarse sand, gravelly loamy coarse sand, coarse sandy loam.	SM, GM	A-1, A-2	0-15	45-95	40-90	20-50	10-35	15-25	NP-5
21*:											
Parkay----------	0-10	Stony loam-------	CL-ML	A-4	5-15	90-100	85-95	75-85	60-70	20-30	5-10
	10-19	Very cobbly loam	CL-ML, GM-GC	A-2, A-6	40-55	60-85	55-80	50-70	40-55	20-30	5-10
	19-45	Extremely cobbly clay loam, very cobbly clay loam.	GC	A-2	60-75	35-75	25-70	25-60	20-50	25-40	10-20
	45	Weathered bedrock	---	---	---	---	---	---	---	---	---

TABLE 14.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
21*:											
Dranyon	0-13	Loam	SM-SC, CL-ML	A-4	0-5	95-100	90-100	65-85	40-75	20-30	5-10
	13-36	Loam, gravelly sandy loam.	CL-ML	A-4	0-15	90-100	75-95	65-80	55-70	25-30	5-10
	36-53	Very cobbly clay loam.	GC	A-2	40-50	50-60	40-50	30-40	25-35	35-45	10-20
	53	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Cavanaugh	0-5	Very stony loam	CL-ML, ML	A-4	10-20	90-100	85-95	75-85	60-70	25-35	5-10
	5-21	Cobbly clay loam, cobbly clay.	CH, CL	A-7	15-40	85-95	80-90	70-80	55-75	40-55	20-30
	21-32	Very cobbly clay, extremely cobbly clay loam, very cobbly clay loam, very gravelly clay loam.	GC, CH, CL	A-7	35-65	50-70	45-65	40-60	35-55	40-55	20-30
	32	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
22*:											
Parkay	0-10	Stony loam	CL-ML	A-4	5-15	90-100	85-95	75-85	60-70	20-30	5-10
	10-19	Very cobbly loam	CL-ML, GM-GC	A-2, A-6	40-55	60-85	55-80	50-70	40-55	20-30	5-10
	19-45	Extremely cobbly clay loam, very cobbly clay loam.	GC	A-2	60-75	35-75	25-70	25-60	20-50	25-40	10-20
	45	Weathered bedrock	---	---	---	---	---	---	---	---	---
Wickahoney	0-4	Rubbly silt loam	CL-ML, CL	A-4, A-6	75-85	80-90	75-85	60-75	50-65	25-35	5-15
	4-6	Cobbly clay loam, very stony clay loam, stony loam.	SC, CL	A-6	15-40	75-90	70-85	60-80	45-65	30-40	10-20
	6-16	Very cobbly clay, very gravelly clay, very gravelly clay loam.	CL, CH, GC, SC	A-7	25-55	55-95	50-90	45-85	40-75	40-55	20-35
	16	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Boulder Lake	0-17	Clay	CH	A-7	0	100	100	90-100	80-95	60-70	45-55
	17-72	Clay, silty clay	CH	A-7	0	100	100	90-100	80-95	60-70	45-55
23 Paynecreek	0-12	Gravelly loam	GM-GC, GM, SM-SC, SM	A-2, A-4	0	65-100	60-75	50-65	30-50	20-30	NP-10
	12-45	Sandy clay loam, gravelly sandy clay loam, gravelly clay loam.	SC, CL	A-6	0	75-100	70-100	60-90	35-55	30-40	10-20
	45-84	Very gravelly loamy coarse sand.	GP-GM, SP-SM, GM, SM	A-1	0-10	40-65	25-50	10-25	5-15	---	NP

See footnote at end of table.

TABLE 14.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
24---------- Paynecreek	0-17	Gravelly loam----	GM-GC, GM, SM-SC, SM	A-2, A-4	0	65-100	60-75	50-65	30-50	20-30	NP-10
	17-38	Sandy clay loam, gravelly sandy clay loam, gravelly clay loam.	SC, CL	A-6	0	75-100	70-100	60-90	35-55	30-40	10-20
	38-50	Gravelly sandy loam, very gravelly sandy loam.	GM, GM-GC, SM, SM-SC	A-2, A-1	0	40-85	35-75	25-55	15-30	20-30	NP-10
	50-84	Very gravelly loamy coarse sand.	GP-GM, SP-SM, GM, SM	A-1	0-10	40-65	25-50	10-25	5-15	---	NP
25*:											
Paynecreek------	0-17	Gravelly loam----	GM-GC, GM, SM-SC, SM	A-2, A-4	0	65-100	60-75	50-65	30-50	20-30	NP-10
	17-38	Sandy clay loam, gravelly sandy clay loam, gravelly clay loam.	SC, CL	A-6	0	75-100	70-100	60-90	35-55	30-40	10-20
	38-50	Gravelly sandy loam, very gravelly sandy loam.	GM, GM-GC, SM, SM-SC	A-2, A-1	0	40-85	35-75	25-55	15-30	20-30	NP-10
	50-84	Very gravelly loamy coarse sand.	GP-GM, SP-SM, GM, SM	A-1	0-10	40-65	25-50	10-25	5-15	---	NP
Thacker---------	0-4	Loam----------	CL, CL-ML	A-4, A-6	0	95-100	85-100	75-100	60-90	20-35	5-15
	4-12	Gravelly loam, loam, clay loam.	CL, SC	A-6	0	80-100	70-100	60-100	45-80	25-40	10-20
	12-21	Clay----------	CL, CH	A-7	0	95-100	85-100	80-100	75-95	40-70	20-45
	21-30	Indurated--------	---	---	---	---	---	---	---	---	---
	30-84	Stratified sand to extremely gravelly sand.	GP, SP, GP-GM, SP-SM	A-1	0	40-100	30-100	15-60	0-10	---	NP
26*:											
Petan----------	0-10	Extremely stony loam.	CL	A-6	50-70	70-90	65-85	60-70	50-60	25-35	10-15
	10-17	Very cobbly clay, very stony clay.	CH	A-7	40-55	65-85	60-80	55-75	50-70	50-65	25-40
	17-21	Indurated--------	---	---	---	---	---	---	---	---	---
	21	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Deunah----------	0-4	Stony silt loam	CL-ML, CL	A-4, A-6	5-20	95-100	95-100	85-100	70-90	20-35	5-15
	4-9	Silty clay loam, clay loam, silt loam.	CL	A-6	0-10	95-100	95-100	80-100	70-90	25-40	10-20
	9-19	Clay----------	CH	A-7	0-10	95-100	95-100	90-100	85-95	60-80	30-45
	19-23	Loam, clay loam	CL-ML, CL	A-4, A-6	0-10	95-100	95-100	80-100	60-75	25-35	5-15
	23-28	Indurated--------	---	---	---	---	---	---	---	---	---
	28	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Hatpeak---------	0-16	Silt loam--------	CL-ML, CL	A-4, A-6	0-10	95-100	95-100	85-100	70-90	25-35	5-15
	16-24	Silty clay loam	ML, CL	A-6, A-7	0-10	95-100	95-100	95-100	85-90	35-45	10-20
	24-34	Clay----------	CL, CH	A-7	0-10	95-100	95-100	85-100	75-95	45-55	20-30
	34-41	Indurated--------	---	---	---	---	---	---	---	---	---
	41	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
27*: Rubble land.											

See footnote at end of table.

TABLE 14.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
27*:											
Deunah----------	0-4	Stony silt loam	CL-ML, CL	A-4, A-6	5-20	95-100	95-100	85-100	70-90	20-35	5-15
	4-9	Silty clay loam, clay loam, silt loam.	CL	A-6	0-10	95-100	95-100	80-100	70-90	25-40	10-20
	9-19	Clay----------	CH	A-7	0-10	95-100	95-100	90-100	85-95	60-80	30-45
	19-23	Loam, clay loam	CL-ML, CL	A-4, A-6	0-10	95-100	95-100	80-100	60-75	25-35	5-15
	23-28	Indurated--------	---	---	---	---	---	---	---	---	---
	28	Unweathered bedrock.	---	---	---	---	--	---	---	---	---
28*:											
Rubble land.											
Rock outcrop.											
Argixerolls.											
29*:											
Searla----------	0-15	Gravelly loam----	SM-SC, GM-GC	A-4	5-10	65-85	60-80	45-60	35-50	25-30	5-10
	15-32	Very gravelly clay loam.	GC	A-2	5-15	45-60	35-50	25-40	20-35	30-40	10-15
	32-60	Very gravelly loam, very gravelly sandy loam.	GM-GC	A-1, A-2	0-15	35-60	25-50	15-35	10-30	25-30	5-10
Povey----------	0-10	Gravelly loam----	SM-SC, GM-GC	A-4	0-5	55-80	50-75	40-65	35-45	25-30	5-10
	10-46	Very gravelly loam, very cobbly loam.	GM-GC	A-2, A-4	5-55	35-65	30-60	25-55	20-50	25-30	5-10
	46-60	Extremely cobbly loam.	GM-GC	A-2, A-4	45-60	30-60	25-55	15-50	15-45	25-30	5-10
30----------	0-18	Sandy loam-------	SM	A-1, A-2	0	80-100	75-95	40-70	20-35	20-25	NP-5
Simonton	18-35	Sandy loam, sandy clay loam.	SM-SC, SM	A-2, A-4	0	90-100	80-100	50-75	25-45	25-35	5-10
	35-59	Loamy sand-------	SM	A-1, A-2	0	90-100	80-100	30-50	20-30	---	NP
	59-84	Loam----------	CL-ML, ML	A-4	0	100	100	85-95	60-75	25-35	5-10
31*:											
Simonton--------	0-18	Sandy loam-------	SM	A-1, A-2	0	80-100	75-95	40-70	20-35	20-25	NP-5
	18-35	Sandy loam, sandy clay loam.	SM-SC, SM	A-2, A-4	0	90-100	80-100	50-75	25-45	25-35	5-10
	35-59	Loamy sand-------	SM	A-1, A-2	0	90-100	80-100	30-50	20-30	---	NP
	59-84	Loam----------	CL-ML, ML	A-4	0	100	100	85-95	60-75	25-35	5-10
Bluecreek-------	0-11	Sandy loam-------	SM, SM-SC	A-2, A-4	0	90-100	85-100	55-70	25-50	20-30	NP-10
	11-20	Clay, sandy clay, clay loam.	CH, CL, SC	A-6, A-7	0	85-100	80-100	70-100	40-85	30-55	10-30
	20-26	Gravelly sandy loam, sandy loam, gravelly sandy clay loam.	SM, SM-SC, SC	A-2, A-4, A-1, A-6	0	65-100	60-95	35-80	20-50	20-35	NP-15
	26-44	Cemented---------	---	---	---	---	---	---	---	---	---
	44-84	Gravelly loamy sand, very gravelly sand, sand.	SW	A-1	0	60-90	40-80	15-35	0-5	---	NP
32*, 33*:											
Simonton--------	0-15	Coarse sandy loam	SM	A-1, A-2	0	80-100	75-95	40-70	20-35	20-25	NP-5
	15-41	Gravelly coarse sandy loam, gravelly sandy clay loam.	SM-SC, SM	A-2, A-4	0	65-80	60-75	30-65	20-40	25-35	5-10
	41-80	Very gravelly loamy coarse sand.	SM, GM	A-1	0	50-75	35-50	15-20	10-15	---	NP
	80-84	Loam----------	CL-ML, ML	A-4	0	100	100	85-95	60-75	25-35	5-10

TABLE 14.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
32*, 33*:											
Thacker---------	0-4	Loam----------	CL, CL-ML	A-4, A-6	0	95-100	85-100	75-100	60-90	20-35	5-15
	4-12	Gravelly loam, loam, clay loam.	CL, SC	A-6	0	80-100	70-100	60-100	45-80	25-40	10-20
	12-21	Clay----------	CL, CH	A-7	0	95-100	85-100	80-100	75-95	40-70	20-45
	21-30	Indurated--------	---	---	---	---	---	---	---	---	---
	30-84	Stratified sand to extremely gravelly sand.	GP, SP, GP-GM, SP-SM	A-1	0	40-100	30-100	15-60	0-10	---	NP
34----------	0-6	Silt loam--------	CL-ML	A-4	0	100	100	85-95	70-85	20-30	5-10
Soonahbe	6-31	Clay loam, loam	CL	A-6	0	100	100	85-95	70-85	30-40	10-20
	31-46	Silt loam, loam	ML	A-4	0	100	100	85-95	60-75	20-25	NP-5
	46-59	Indurated--------	---	---	---	---	---	---	---	---	---
	59-80	Silt loam, loam	ML	A-4	0	100	95-100	80-95	60-75	20-25	NP-5
	80-84	Gravelly coarse sand.	SP-SM, SP	A-1	0	55-80	50-75	20-40	0-10	---	NP
35*:											
Soonahbe--------	0-6	Silt loam--------	CL-ML	A-4	0	100	100	85-95	70-85	20-30	5-10
	6-31	Clay loam, loam	CL	A-6	0	100	100	85-95	70-85	30-40	10-20
	31-46	Silt loam, loam	ML	A-4	0	100	100	85-95	60-75	20-25	NP-5
	46-59	Indurated--------	---	---	---	---	---	---	---	---	---
	59-80	Silt loam, loam	ML	A-4	0	100	95-100	80-95	60-75	20-25	NP-5
	80-84	Gravelly coarse sand.	SP-SM, SP	A-1	0	55-80	50-75	20-40	0-10	---	NP
Thacker---------	0-4	Loam----------	CL, CL-ML	A-4, A-6	0	95-100	85-100	75-100	60-90	20-35	5-15
	4-12	Gravelly loam, loam, clay loam.	CL, SC	A-6	0	80-100	70-100	60-100	45-80	25-40	10-20
	12-21	Clay----------	CL, CH	A-7	0	95-100	85-100	80-100	75-95	40-70	20-45
	21-30	Indurated--------	---	---	---	---	---	---	---	---	---
	30-84	Stratified sand to extremely gravelly sand.	GP, SP, GP-GM, SP-SM	A-1	0	40-100	30-100	15-60	0-10	---	NP
36*:											
Soonahbe Variant	0-3	Fine sandy loam	SM, ML	A-4	0	95-100	85-100	65-85	45-55	20-25	NP-5
	3-21	Loam----------	CL, CL-ML	A-4, A-6	0	95-100	85-100	75-95	60-75	25-35	5-15
	21-28	Gravelly sandy loam, very gravelly sandy loam, gravelly loam.	GC, GM, SM, SC	A-2, A-1, A-4, A-6	0-5	55-80	45-75	30-45	15-40	20-35	NP-15
	28	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Bulake----------	0-2	Fine sandy loam	SM	A-4	0-10	90-100	85-95	70-75	45-50	20-25	NP-5
	2-8	Gravelly loam, loam.	CL, CL-ML	A-4, A-6	0-10	80-95	70-85	70-75	50-60	20-30	5-15
	8-15	Clay----------	CL, CH	A-7	0-10	95-100	90-100	85-95	80-90	40-55	20-30
	15	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
37*:											
Strickland------	0-13	Loam----------	CL-ML	A-4	0-15	95-100	90-100	80-90	65-75	20-30	5-10
	13-28	Loam, cobbly loam	CL-ML, CL	A-4, A-6	5-40	85-95	80-90	60-80	50-65	25	5-15
	28-35	Weathered bedrock	---	---	---	---	---	---	---	---	---
Bluebell--------	0-17	Loam----------	ML	A-4	0-15	95-100	90-100	80-90	60-70	20-25	NP-5
	17-22	Loam----------	CL-ML, ML	A-4	5-15	95-100	90-100	80-90	65-75	25-35	5-10
	22-29	Very stony clay loam.	CL	A-6	55-70	85-95	75-85	70-80	55-65	30-40	10-20
	29	Unweathered bedrock.	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 14.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
38---------- Thacker	0-4	Loam----------	CL, CL-ML	A-4, A-6	0	95-100	85-100	75-100	60-90	20-35	5-15
	4-12	Gravelly loam, loam, clay loam.	CL, SC	A-6	0	80-100	70-100	60-100	45-80	25-40	10-20
	12-21	Clay----------	CL, CH	A-7	0	95-100	85-100	80-100	75-95	40-70	20-45
	21-30	Indurated--------	---	---	---	---	---	---	---	---	---
	30-84	Stratified sand to extremely gravelly sand.	GP, SP, GP-GM, SP-SM	A-1	0	40-100	30-100	15-60	0-10	---	NP
39---------- Thacker	0-4	Very stony loam	CL, CL-ML, SC, SM-SC	A-4, A-6	10-20	80-100	70-100	60-95	40-75	20-35	5-15
	4-12	Gravelly loam, loam, clay loam.	CL, SC	A-6	0	80-100	70-100	60-100	45-80	25-40	10-20
	12-21	Clay----------	CL, CH	A-7	0	95-100	85-100	80-100	75-95	40-70	20-45
	21-30	Indurated--------	---	---	---	---	---	---	---	---	---
	30-84	Stratified sand to extremely gravelly sand.	GP, SP, GP-GM, SP-SM	A-1	0	40-100	30-100	15-60	0-10	---	NP
40*, 41*: Thacker---------	0-4	Loam----------	CL, CL-ML	A-4, A-6	0	95-100	85-100	75-100	60-90	20-35	5-15
	4-12	Gravelly loam, loam, clay loam.	CL, SC	A-6	0	80-100	70-100	60-100	45-80	25-40	10-20
	12-21	Clay----------	CL, CH	A-7	0	95-100	85-100	80-100	75-95	40-70	20-45
	21-30	Indurated--------	---	---	---	---	---	---	---	---	---
	30-84	Stratified sand to extremely gravelly sand.	GP, SP, GP-GM, SP-SM	A-1	0	40-100	30-100	15-60	0-10	---	NP
Simonton--------	0-15	Coarse sandy loam	SM	A-1, A-2	0	80-100	75-95	40-70	20-35	20-25	NP-5
	15-41	Gravelly coarse sandy loam, gravelly sandy clay loam.	SM-SC, SM	A-2, A-4	0	65-80	60-75	30-65	20-40	25-35	5-10
	41-80	Very gravelly loamy coarse sand.	SM, GM	A-1	0	50-75	35-50	15-20	10-15	---	NP
	80-84	Loam----------	CL-ML, ML	A-4	0	100	100	85-95	60-75	25-35	5-10
42*: Thacker---------	0-4	Loam----------	CL, CL-ML	A-4, A-6	0	95-100	85-100	75-100	60-90	20-35	5-15
	4-12	Gravelly loam, loam, clay loam.	CL, SC	A-6	0	80-100	70-100	60-100	45-80	25-40	10-20
	12-21	Clay----------	CL, CH	A-7	0	95-100	85-100	80-100	75-95	40-70	20-45
	21-30	Indurated--------	---	---	---	---	---	---	---	---	---
	30-84	Stratified sand to extremely gravelly sand.	GP, SP, GP-GM, SP-SM	A-1	0	40-100	30-100	15-60	0-10	---	NP
Soonahbe--------	0-6	Silt loam--------	CL-ML	A-4	0	100	100	85-95	70-85	20-30	5-10
	6-31	Clay loam, loam	CL	A-6	0	100	100	85-95	70-85	30-40	10-20
	31-46	Silt loam, loam	ML	A-4	0	100	100	85-95	60-75	20-25	NP-5
	46-59	Indurated--------	---	---	---	---	---	---	---	---	---
	59-80	Silt loam, loam	ML	A-4	0	100	95-100	80-95	60-75	20-25	NP-5
	80-84	Gravelly coarse sand.	SP-SM, SP	A-1	0	55-80	50-75	20-40	0-10	---	NP
43*: Thacker---------	0-4	Loam----------	CL, CL-ML	A-4, A-6	0	95-100	85-100	75-100	60-90	20-35	5-15
	4-12	Gravelly loam, loam, clay loam.	CL, SC	A-6	0	80-100	70-100	60-100	45-80	25-40	10-20
	12-21	Clay----------	CL, CH	A-7	0	95-100	85-100	80-100	75-95	40-70	20-45
	21-30	Indurated--------	---	---	---	---	---	---	---	---	---
	30-84	Stratified sand to extremely gravelly sand.	GP, SP, GP-GM, SP-SM	A-1	0	40-100	30-100	15-60	0-10	---	NP

See footnote at end of table.

TABLE 14.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
43*:											
Yatahoney-------	0-4	Loam----------	CL-ML	A-4	0-5	95-100	85-95	75-85	60-75	25-30	5-10
	4-9	Clay loam, sandy clay loam, gravelly clay loam.	CL, CL-ML	A-4, A-6	0-5	70-100	65-100	60-95	50-75	25-40	5-15
	9-25	Clay----------	CL, CH	A-7	0-5	95-100	90-100	85-100	70-90	40-60	20-40
	25-32	Indurated--------	---	---	---	---	---	---	---	---	---
	32	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
44----------	0-4	Silty clay loam	CL	A-6, A-7	0	100	95-100	95-100	85-90	35-45	15-25
Tucker	4-59	Silty clay, clay loam, silty clay loam.	CL, CH	A-7	0	95-100	95-100	95-100	90-95	40-55	15-30
	59-84	Clay loam--------	CL	A-6, A-7	0	100	95-100	85-95	70-80	35-45	15-25
45----------	0-6	Silty clay loam	CL	A-6	0	100	95-100	90-100	85-95	35-40	15-20
Tucker	6-22	Silty clay loam, silty clay, clay.	CL, CH	A-7	0	100	95-100	90-100	80-95	40-55	20-35
	22-46	Clay loam, loam	CL	A-6	0	100	90-100	80-95	65-80	25-35	10-20
	46-84	Stratified very gravelly coarse sand to very gravelly sandy loam.	SP-SM, SM	A-1	0	75-85	35-50	25-35	5-15	---	NP
46----------	0-5	Silty clay loam	CL-ML, CL	A-4, A-6	0	100	95-100	85-100	75-85	25-35	5-15
Tucker Variant	5-23	Silty clay loam, clay loam, clay.	CL, CH	A-7	0	100	95-100	80-100	70-95	40-55	20-35
	23-27	Clay loam--------	CL	A-6, A-7	0	100	90-100	85-95	60-75	35-45	15-25
	27-60	Very gravelly sand.	SP, GP	A-1	0	45-60	35-50	20-30	0-5	---	NP
47*:											
Watchabob-------	0-15	Gravelly coarse sandy loam.	SM	A-1, A-2	0	65-95	55-75	35-50	20-30	15-20	NP-5
	15-26	Gravelly sandy clay loam, gravelly sandy clay loam, gravelly coarse sandy loam.	SC, SM-SC	A-2, A-4, A-6	0	70-85	55-70	30-60	20-45	25-35	5-15
	26-28	Extremely gravelly coarse sandy loam.	GP-GM, GM	A-1	0	25-40	10-25	5-20	5-15	15-20	NP-5
	28	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Bearskin Variant	0-8	Loam----------	CL-ML	A-4	0	90-100	85-100	75-90	60-70	20-30	5-10
	8-12	Gravelly clay loam.	GM-GC, GC, SM-SC, SC	A-2, A-4, A-6	0	55-75	50-70	40-70	30-50	25-35	5-15
	12-16	Very gravelly sandy clay loam.	GM-GC, GC	A-2	0	45-55	40-50	30-40	20-30	25-35	5-15
	16	Weathered bedrock	---	---	---	---	---	---	---	---	---
48----------	0-5	Stony loam-------	SM-SC	A-4	5-10	70-80	65-80	50-65	35-45	25-30	5-10
Wickahoney	5-13	Cobbly clay loam, very stony clay loam, very cobbly loam.	SC, CL	A-6	15-40	75-90	70-85	60-80	45-65	30-40	10-20
	13-18	Very cobbly clay, very gravelly clay, very gravelly clay loam.	CL, CH, GC, SC	A-7	25-55	55-95	50-90	45-85	40-75	40-55	20-35
	18	Unweathered bedrock.	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 14.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
49*:											
Wickahoney------	0-4	Rubbly silt loam	CL-ML, CL	A-4, A-6	75-85	80-90	75-85	60-75	50-65	25-35	5-15
	4-6	Cobbly clay loam, very stony clay loam, stony loam.	SC, CL	A-6	15-40	75-90	70-85	60-80	45-65	30-40	10-20
	6-16	Very cobbly clay, very gravelly clay, very gravelly clay loam.	CL, CH, GC, SC	A-7	25-55	55-95	50-90	45-85	40-75	40-55	20-35
	16	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Blackleg--------	0-13	Stony loam-------	CL-ML, CL, SM-SC, SC	A-4, A-6	5-35	85-95	85-90	55-85	45-65	25-35	5-15
	13-23	Cobbly clay, cobbly clay loam.	CL, CH	A-6, A-7	15-35	80-95	75-90	65-85	50-80	30-55	10-30
	23-36	Very cobbly clay, very cobbly clay loam, very gravelly clay.	CL, CH, GC	A-7, A-2, A-6	5-50	40-80	35-70	30-65	25-60	35-65	15-45
	36-50	Indurated--------	---	---	---	---	---	---	---	---	---
50*:											
Wickahoney------	0-4	Rubbly silt loam	CL-ML, CL	A-4, A-6	75-85	80-90	75-85	60-75	50-65	25-35	5-15
	4-6	Cobbly clay loam, very stony clay loam, stony loam.	SC, CL	A-6	15-40	75-90	70-85	60-80	45-65	30-40	10-20
	6-16	Very cobbly clay, very gravelly clay, very gravelly clay loam.	CL, CH, GC, SC	A-7	25-55	55-95	50-90	45-85	40-75	40-55	20-35
	16	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Wagonbox--------	0-5	Rubbly silty clay loam.	CL	A-6	75-85	95-100	90-100	85-95	75-85	30-40	10-15
	5-17	Very cobbly clay, very stony clay, very cobbly clay loam.	CL, CH	A-7	50-75	95-100	95-100	90-100	75-90	40-55	20-30
	17-23	Indurated--------	---	---	---	---	---	---	---	---	---
	23	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
51*:											
Yatahoney-------	0-4	Very cobbly loam	CL-ML	A-4	10-55	95-100	90-100	80-90	60-75	25-30	5-10
	4-20	Clay-------------	CL, CH	A-7	0-5	95-100	90-100	85-100	70-90	40-60	20-40
	20-40	Indurated--------	---	---	---	---	---	---	---	---	---
	40	Unweathered	---	---	---	---	---	---	---	---	---
Blackleg--------	0-4	Extremely stony silt loam.	CL, SC	A-6	20-35	80-95	75-90	50-85	40-65	30-40	10-15
	4-15	Silty clay loam, cobbly silty clay loam.	CL	A-6, A-7	10-35	80-95	75-90	70-85	55-70	35-45	15-25
	15-24	Extremely cobbly clay.	CH, CL	A-7	75-85	70-85	65-80	60-75	55-70	45-70	25-45
	24-37	Cobbly clay------	CH, CL	A-7	15-25	75-85	70-80	65-75	60-70	45-70	25-45
	37-60	Indurated--------	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 14.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
52*:											
Yatahoney-------	0-4	Loam----------	CL-ML	A-4	0-5	95-100	85-95	75-85	60-75	25-30	5-10
	4-9	Clay loam, sandy clay loam, gravelly clay loam.	CL, CL-ML	A-4, A-6	0-5	70-100	65-100	60-95	50-75	25-40	5-15
	9-25	Clay----------	CL, CH	A-7	0-5	95-100	90-100	85-100	70-90	40-60	20-40
	25-32	Indurated--------	---	---	---	---	---	---	---	---	---
	32	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Soonahbe--------	0-5	Silt loam--------	CL-ML	A-4	0	100	100	85-95	70-85	20-30	5-10
	5-46	Clay loam, loam	CL	A-6	0	100	100	85-95	70-85	30-40	10-20
	46-70	Indurated--------	---	---	---	---	---	---	---	---	---
53, 54----------	0-16	Loam----------	CL-ML, CL	A-4, A-6	0	100	100	85-95	65-75	25-35	5-15
Zola	16-28	Silty clay loam	CL	A-6	0	100	100	95-100	80-90	35-40	20-25
	28-65	Loam----------	CL	A-6	0	100	100	85-95	65-75	30-35	10-15
	65-73	Loamy coarse sand	SM	A-1	0	100	90-100	30-45	15-35	---	NP
	73-84	Clay loam--------	CL	A-6, A-7	0	100	100	80-95	70-80	35-45	20-30
55*:											
Zola----------	0-16	Loam----------	CL-ML, CL	A-4, A-6	0	100	100	85-95	65-75	25-35	5-15
	16-28	Silty clay loam	CL	A-6	0	100	100	95-100	80-90	35-40	20-25
	28-65	Loam----------	CL	A-6	0	100	100	85-95	65-75	30-35	10-15
	65-73	Loamy coarse sand	SM	A-1	0	100	90-100	30-45	15-35	---	NP
	73-84	Clay loam--------	CL	A-6, A-7	0	100	100	80-95	70-80	35-45	20-30
Hayspur---------	0-4	Clay loam--------	CL	A-6	0-5	95-100	90-100	80-95	65-80	30-40	15-25
	4-59	Stratified silty clay loam to loam.	CL	A-6	6.-8.	95-100	90-100	75-100	55-85	25-40	10-25
	59-84	Very gravelly loamy sand.	SM, GM	A-1	0-5	40-60	30-50	20-30	10-15	---	NP

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 15.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS

[The symbol < means less than; > means more than. Entries under "Erosion factors--T" apply to the entire profile. Entries under "Wind erodibility group" and "Organic matter" apply only to the surface layer. Absence of an entry indicates that data were not available or were not estimated]

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Salinity	Shrink-swell potential	Erosion factors		Wind erodibility group	Organic matter
									K	T		
	In	Pct	G/cm³	In/hr	In/in	pH	mmhos/cm					Pct
1*:												
Bedstead--------	0-11	20-27	1.40-1.50	0.2-0.6	0.09-0.11	6.1-7.3	<2	Moderate	0.24	2	8	1-2
	11-21	35-55	1.20-1.40	0.06-0.2	0.06-0.09	6.1-7.8	<2	High------	0.10			
	21-22	---	---	---	---	---	---	----------	----			
	22	---	---	---	---	---	---	----------	----			
Arbidge---------	0-3	15-25	1.40-1.50	0.2-0.6	0.15-0.18	6.6-7.3	<2	Low-------	0.49	2	5	1-3
	3-19	20-34	1.40-1.50	0.2-0.6	0.14-0.18	6.6-7.8	<2	Moderate	0.20			
	19-30	15-25	1.40-1.50	0.6-2.0	0.09-0.15	7.4-9.0	2-4	Low-------	0.20			
	30-38	---	---	---	---	---	---	----------	----			
	38-60	0-5	1.60-1.70	>20.0	0.03-0.05	6.6-9.0	<2	Low-------	0.02			
2*:												
Blackfoot--------	0-7	18-22	1.20-1.40	0.6-2.0	0.19-0.21	7.4-8.4	2-4	Low-------	0.37	5	4L	1-3
	7-34	18-26	1.30-1.50	0.6-2.0	0.16-0.18	7.4-8.4	<2	Low-------	0.37			
	34-45	15-32	1.40-1.60	0.2-0.6	0.19-0.21	6.6-8.4	<2	Moderate	0.43			
	45-65	16-35	1.30-1.50	0.2-0.6	0.16-0.19	7.4-8.4	<2	Low-------	0.32			
	65-84	0-5	1.60-1.75	>20.0	0.01-0.03	6.6-7.3	<2	Low-------	0.10			
Tucker----------	0-6	28-35	1.35-1.45	0.2-0.6	0.18-0.21	6.1-7.8	<2	Moderate	0.43	1	7	2-4
	6-22	30-50	1.20-1.35	0.06-0.2	0.15-0.21	6.6-7.8	<2	High------	0.43			
	22-46	20-30	1.40-1.50	0.2-0.6	0.17-0.21	6.6-7.8	<2	Moderate	0.37			
	46-84	0-8	1.60-1.70	>6.0	0.03-0.06	6.6-8.4	<2	Low-------	0.05			
3*:												
Bluecreek-------	0-11	15-20	1.55-1.65	2.0-6.0	0.10-0.11	6.1-7.3	<2	Low-------	0.24	1	3	1-2
	11-20	35-50	1.20-1.40	0.06-0.2	0.15-0.18	6.1-7.8	<2	High------	0.20			
	20-26	10-25	1.40-1.50	2.0-6.0	0.08-0.15	6.1-9.0	<2	Low-------	0.15			
	26-44	---	---	---	---	---	---	----------	----			
	44-84	0-8	1.60-1.70	>6.0	0.03-0.05	6.6-7.8	<2	Low-------	0.05			
Thacker---------	0-4	15-27	1.40-1.50	0.6-2.0	0.17-0.20	6.1-7.3	<2	Moderate	0.43	1	6	1-2
	4-12	20-35	1.45-1.60	0.2-0.6	0.14-0.17	6.1-7.3	<2	Moderate	0.32			
	12-21	50-60	1.20-1.40	<0.06	0.16-0.18	6.1-7.8	<2	High------	0.20			
	21-30	---	---	---	---	---	---	----------	----			
	30-84	0-5	---	>20	0.02-0.04	7.4-7.8	<2	Low-------	0.02			
4*:												
Bluecreek Variant--------	0-7	10-20	1.40-1.50	0.6-2.0	0.17-0.21	6.6-7.8	2-8	Low-------	0.43	1	5	1-3
	7-12	40-50	1.20-1.40	0.06-0.2	0.14-0.18	7.4-9.0	4-8	High------	0.20			
	12-21	25-40	1.40-1.60	0.2-0.6	0.15-0.21	7.9-9.0	4-8	Moderate	0.37			
	21-90	0-5	1.60-1.70	>20	0.03-0.05	7.9-9.0	<4	Low-------	0.02			
Paynecreek Variant--------	0-12	8-15	1.40-1.50	0.6-2.0	0.14-0.18	6.6-7.3	<2	Low-------	0.32	2	5	1-2
	12-17	10-20	1.50-1.60	0.6-6.0	0.10-0.18	7.4-7.8	<2	Low-------	0.32			
	17-35	20-30	1.45-1.60	0.2-0.6	0.16-0.19	7.9-9.0	2-4	Moderate	0.37			
	35-82	0-5	1.60-1.70	>20	0.03-0.05	7.9-8.4	2-4	Low-------	0.15			
5*:												
Boulder Lake----	0-17	60-80	1.20-1.30	<0.06	0.14-0.15	6.1-7.3	<2	High------	0.20	5	8	1-2
	17-72	60-80	1.20-1.40	<0.06	0.14-0.15	6.6-8.4	<2	High------	0.20			
Tucker----------	0-2	28-35	1.35-1.45	0.2-0.6	0.18-0.21	6.1-7.8	<2	Moderate	0.43	1	7	2-4
	2-22	30-50	1.20-1.35	0.06-0.2	0.15-0.21	6.6-7.8	<2	High------	0.43			
	22-46	20-30	1.40-1.50	0.2-0.6	0.17-0.21	6.6-7.8	<2	Moderate	0.37			
	46-84	0-8	1.60-1.70	>6.0	0.03-0.06	6.6-8.4	<2	Low-------	0.05			
6*:												
Bulake----------	0-4	10-20	1.40-1.50	0.6-2.0	0.16-0.18	6.6-7.3	<2	Low-------	0.32	1	5	1-2
	4-8	10-27	1.50-1.60	0.6-2.0	0.15-0.18	6.6-7.3	<2	Moderate	0.32			
	8-17	40-50	1.20-1.40	0.06-0.2	0.14-0.17	6.6-7.3	<2	High------	0.24			
	17	---	---	---	---	---	---	----------	----			

See footnote at end of table.

TABLE 15.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Salinity	Shrink-swell potential	Erosion factors		Wind erodibility group	Organic matter
									K	T		
	In	Pct	G/cm³	In/hr	In/in	pH	mmhos/cm					Pct
6*:												
Deunah----------	0-9	18-25	1.40-1.50	0.6-2.0	0.10-0.13	5.6-6.5	<2	Low-------	0.17	1	8	1-2
	9-14	27-33	1.30-1.50	0.2-0.6	0.16-0.18	6.1-7.3	<2	Moderate	0.37			
	14-20	60-70	1.25-1.45	<0.06	0.12-0.15	6.6-7.3	<2	High------	0.28			
	20-26	---	---	---	---	---	---	----------	----			
	26	---	---	---	---	---	---	----------	----			
7*:												
Burmah Variant--	0-12	18-27	1.40-1.50	0.6-2.0	0.19-0.21	5.6-6.0	<2	Moderate	0.43	2	6	1-2
	12-40	45-60	1.20-1.40	<0.06	0.15-0.18	6.6-7.8	<2	High------	0.32			
	40-60	25-40	1.40-1.60	0.2-0.6	0.15-0.18	7.4-7.8	<2	Moderate	0.37			
Torney Variant--	0-13	20-26	1.40-1.50	0.6-2.0	0.19-0.21	6.1-7.3	<2	Low-------	0.43	2	5	2-4
	13-17	27-32	1.40-1.50	0.2-0.6	0.19-0.21	6.1-7.3	<2	Moderate	0.43			
	17-25	40-50	1.25-1.40	0.06-0.2	0.14-0.17	6.1-7.3	<2	High------	0.28			
	25-48	27-32	1.40-1.50	0.2-0.6	0.19-0.21	6.1-7.3	<2	Moderate	0.43			
	48-60	20-26	1.50-1.60	0.6-2.0	0.19-0.21	6.6-7.8	<2	Low-------	0.43			
Yatahoney-------	0-4	20-25	1.20-1.40	0.6-2.0	0.10-0.15	6.1-7.3	<2	Low-------	0.28	2	6	1-2
	4-20	40-55	1.25-1.45	0.06-0.2	0.14-0.16	6.6-8.4	<2	High------	0.28			
	20-40	---	---	---	---	---	---	----------	----			
8*:												
Cavanaugh-------	0-5	20-25	1.40-1.50	0.6-2.0	0.14-0.17	6.1-7.3	<2	Moderate	0.24	2	6	1-3
	5-21	35-50	1.20-1.40	0.06-0.2	0.12-0.16	6.1-7.8	<2	High------	0.15			
	21-32	35-50	1.20-1.40	0.06-0.2	0.08-0.12	6.1-7.8	<2	Moderate	0.10			
	32	---	---	---	---	---	---	----------	----			
Obray-----------	0-4	40-50	1.20-1.30	<0.06	0.14-0.16	6.1-7.3	<2	High------	0.24	1	6	3-6
	4-35	50-60	1.20-1.35	<0.06	0.15-0.17	6.1-7.3	<2	High------	0.24			
	35-61	30-40	1.40-1.50	0.2-0.6	0.15-0.17	6.1-8.4	<2	Moderate	0.32			
9*:												
Cavanaugh-------	0-5	20-25	1.40-1.50	0.6-2.0	0.14-0.17	6.1-7.3	<2	Moderate	0.24	2	6	1-3
	5-21	35-50	1.20-1.40	0.06-0.2	0.12-0.16	6.1-7.8	<2	High------	0.15			
	21-32	35-50	1.20-1.40	0.06-0.2	0.08-0.12	6.1-7.8	<2	Moderate	0.10			
	32	---	---	---	---	---	---	----------	----			
Sattley---------	0-4	10-25	1.40-1.50	0.6-2.0	0.11-0.15	6.1-7.3	<2	Low-------	0.17	2	5	2-3
	4-31	15-35	1.40-1.60	0.6-2.0	0.08-0.11	6.1-7.3	<2	Moderate	0.15			
	31-43	15-25	1.50-1.60	0.6-2.0	0.05-0.08	6.1-7.3	<2	Low-------	0.10			
	43	---	---	---	---	---	---	----------	----			
10*:												
Crooked Creek---	0-4	15-27	1.40-1.50	0.6-2.0	0.19-0.21	5.6-7.3	<2	Low-------	0.43	5	6	3-6
	4-25	40-50	1.20-1.40	0.06-0.2	0.15-0.18	6.1-7.3	<2	High------	0.32			
	25-84	18-39	1.30-1.50	0.2-0.6	0.19-0.22	7.4-8.4	<2	Moderate	0.43			
Bear Lake-------	0-9	15-27	1.40-1.50	0.6-2.0	0.19-0.21	7.4-8.4	2-4	Low-------	0.43	5	4L	3-6
	9-45	18-39	1.35-1.45	0.2-0.6	0.19-0.22	7.4-9.0	2-8	Moderate	0.43			
	45-60	40-50	1.20-1.40	0.06-0.2	0.15-0.18	7.4-8.4	2-8	High------	0.32			
11----------	0-4	15-27	1.20-1.40	0.6-2.0	0.16-0.20	5.6-7.3	<2	Moderate	0.43	1	6	1-2
Deunah	4-9	18-35	1.30-1.50	0.2-0.6	0.18-0.20	6.1-7.3	<2	Moderate	0.43			
	9-19	60-70	1.25-1.45	<0.06	0.12-0.15	6.6-7.8	<2	High------	0.20			
	19-23	20-30	1.30-1.50	0.2-0.6	0.18-0.19	7.4-7.8	<2	Moderate	0.32			
	23-28	---	---	---	---	---	---	----------	----			
	28	---	---	---	---	---	---	----------	----			
12----------	0-7	10-20	1.40-1.50	0.6-2.0	0.17-0.21	6.6-7.3	<2	Low-------	0.43	1	5	1-3
Disabel Variant	7-23	40-50	1.20-1.45	0.06-0.2	0.14-0.18	7.4-7.8	<2	High------	0.24			
	23-42	25-40	1.45-1.55	0.2-0.6	0.15-0.21	7.4-8.4	<4	Moderate	0.37			
	42-84	15-25	1.50-1.60	0.6-2.0	0.12-0.18	7.4-8.4	4-8	Moderate	0.43			
13*:												
Disabel Variant-	0-7	10-20	1.40-1.50	0.6-2.0	0.17-0.21	6.6-7.3	<2	Low-------	0.43	1	5	1-3
	7-23	40-50	1.20-1.45	0.06-0.2	0.14-0.18	7.4-7.8	<2	High------	0.24			
	23-42	25-40	1.45-1.55	0.2-0.6	0.15-0.21	7.4-8.4	<4	Moderate	0.37			
	42-84	15-25	1.50-1.60	0.6-2.0	0.12-0.18	7.4-8.4	4-8	Moderate	0.43			

See footnote at end of table.

TABLE 15.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Salinity	Shrink-swell potential	Erosion factors		Wind erodibility group	Organic matter
									K	T		
	In	Pct	G/cm³	In/hr	In/in	pH	mmhos/cm					Pct
13*:												
Bluecreek-------	0-11	15-20	1.55-1.65	2.0-6.0	0.10-0.11	6.1-7.3	<2	Low-------	0.24	1	3	1-2
	11-20	35-50	1.20-1.40	0.06-0.2	0.15-0.18	6.1-7.8	<2	High-------	0.20			
	20-26	10-25	1.40-1.50	2.0-6.0	0.08-0.15	6.1-9.0	<2	Low-------	0.15			
	26-44	---	---	---	---	---	---	----------	----			
	44-84	0-8	1.60-1.70	>6.0	0.03-0.05	6.6-7.8	<2	Low-------	0.05			
14*:												
Dranyon---------	0-13	16-20	1.40-1.50	2.0-6.0	0.09-0.17	5.6-7.3	<2	Low-------	0.28	3	3	5-7
	13-36	18-24	1.30-1.40	0.6-2.0	0.12-0.18	5.6-7.3	<2	Low-------	0.28			
	36-53	27-40	1.35-1.45	0.2-0.6	0.09-0.12	5.6-7.3	<2	Moderate	0.28			
	53	---	---	---	---	---	---	----------	----			
Strickland------	0-13	15-23	1.40-1.50	0.6-2.0	0.15-0.18	5.1-6.5	<2	Low-------	0.32	2	6	4-8
	13-28	18-27	1.50-1.60	0.6-2.0	0.11-0.15	5.1-6.5	<2	Moderate	0.28			
	28	---	---	---	---	---	---	----------	----			
Parkay----------	0-10	10-25	1.40-1.50	0.6-2.0	0.13-0.15	6.1-7.3	<2	Low-------	0.32	1	5	2-3
	10-19	10-25	1.50-1.60	0.6-2.0	0.08-0.12	6.1-7.3	<2	Low-------	0.15			
	19-45	27-35	1.40-1.50	0.2-0.6	0.05-0.09	6.1-7.3	<2	Low-------	0.15			
	45	---	---	---	---	---	---	----------	----			
15*:												
Haploxeralfs.												
Durixeralfs.												
Rubble land.												
16----------	0-4	28-35	1.20-1.35	0.2-0.6	0.17-0.20	7.4-8.4	<4	Moderate	0.37	5	4L	2-4
Hayspur	4-59	20-35	1.40-1.60	0.2-0.6	0.17-0.20	7.4-8.4	2-4	Moderate	0.37			
	59-84	5-10	1.60-1.70	6.0-20	0.04-0.06	7.4-8.4	<2	Low-------	0.10			
17*:												
Hayspur---------	0-4	28-35	1.20-1.35	0.2-0.6	0.17-0.20	7.4-8.4	<4	Moderate	0.37	5	4L	2-4
	4-59	20-35	1.40-1.60	0.2-0.6	0.17-0.20	7.4-8.4	2-4	Moderate	0.37			
	59-84	5-10	1.60-1.70	6.0-20	0.04-0.06	7.4-8.4	<2	Low-------	0.10			
Blackfoot-------	0-7	18-27	1.20-1.40	0.6-2.0	0.19-0.21	7.4-8.4	2-4	Low-------	0.37	5	4L	1-3
	7-34	18-26	1.30-1.50	0.6-2.0	0.16-0.18	7.4-8.4	<2	Low-------	0.37			
	34-45	15-32	1.40-1.60	0.2-0.6	0.19-0.21	6.6-8.4	<2	Moderate	0.43			
	45-65	16-40	1.30-1.50	0.6-2.0	0.16-0.19	7.4-8.4	<2	Low-------	0.32			
	65-84	0-5	1.60-1.75	>20.0	0.01-0.03	6.6-7.3	<2	Low-------	0.10			
18*:												
Hayspur---------	0-4	28-35	1.20-1.35	0.2-0.6	0.17-0.20	7.4-8.4	<4	Moderate	0.37	5	4L	2-4
	4-59	20-35	1.40-1.60	0.2-0.6	0.17-0.20	7.4-8.4	2-4	Moderate	0.37			
	59-84	5-10	1.60-1.70	6.0-20	0.04-0.06	7.4-8.4	<2	Low-------	0.10			
Zola----------	0-16	14-27	1.40-1.50	0.6-2.0	0.16-0.18	6.6-7.8	<2	Moderate	0.32	5	5	2-4
	16-28	30-36	1.35-1.45	0.2-0.6	0.19-0.21	7.4-8.4	2-4	Moderate	0.32			
	28-65	18-26	1.50-1.60	0.6-2.0	0.16-0.18	6.6-7.8	<2	Moderate	0.37			
	65-73	0-5	1.60-1.70	6.0-20	0.04-0.06	6.6-7.8	<2	Low-------	0.05			
	73-84	28-40	1.40-1.50	0.2-0.6	0.19-0.21	6.6-7.8	<2	High------	0.28			
Paynecreek------	0-12	10-20	1.40-1.50	0.6-2.0	0.12-0.15	5.6-7.3	<2	Low-------	0.20	5	6	2-4
	12-45	24-34	1.40-1.50	0.2-0.6	0.15-0.18	6.6-7.8	<2	Moderate	0.17			
	45-84	0-5	1.60-1.70	6.0-20	0.03-0.06	5.6-7.3	<2	Low-------	0.02			
19*:												
Lasauses Variant	0-66	60-75	1.20-1.40	<0.06	0.14-0.17	7.4-9.0	2-4	High------	0.32	5	6	.5-1
Boulder Lake----	0-17	60-80	1.20-1.30	<0.06	0.14-0.15	6.1-7.3	<2	High------	0.20	5	8	1-2
	17-72	60-80	1.20-1.40	<0.06	0.14-0.15	6.6-8.4	<2	High------	0.20			
20*:												
Moonstone-------	0-8	10-15	1.45-1.50	2.0-6.0	0.07-0.12	6.1-7.3	<2	Low-------	0.10	2	---	1-3
	8-28	10-15	1.55-1.65	2.0-6.0	0.08-0.13	6.1-7.3	<2	Low-------	0.10			
	28	---	---	---	---	---	---	----------	----			

See footnote at end of table.

TABLE 15.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Salinity	Shrink-swell potential	Erosion factors		Wind erodibility group	Organic matter
									K	T		
	In	Pct	G/cm³	In/hr	In/in	pH	mmhos/cm					Pct
20*:												
Earcree	0-6	8-18	1.40-1.50	2.0-6.0	0.10-0.13	5.6-6.5	<2	Low	0.10	5	3	2-4
	6-64	5-15	1.45-1.60	2.0-6.0	0.05-0.13	6.1-7.3	<2	Low	0.10			
21*:												
Parkay	0-10	10-25	1.40-1.50	0.6-2.0	0.13-0.15	6.1-7.3	<2	Low	0.32	1	5	2-3
	10-19	10-25	1.50-1.60	0.6-2.0	0.08-0.12	6.1-7.3	<2	Low	0.15			
	19-45	27-35	1.40-1.50	0.2-0.6	0.05-0.09	6.1-7.3	<2	Low	0.15			
	45	---	---	---	---	---	---	---	---			
Dranyon	0-13	16-20	1.40-1.50	2.0-6.0	0.09-0.17	5.6-7.3	<2	Low	0.28	3	3	5-7
	13-36	18-24	1.30-1.40	0.6-2.0	0.12-0.18	5.6-7.3	<2	Low	0.28			
	36-53	27-40	1.35-1.45	0.2-0.6	0.09-0.12	5.6-7.3	<2	Moderate	0.28			
	53	---	---	---	---	---	---	---	---			
Cavanaugh	0-5	20-25	1.40-1.50	0.6-2.0	0.14-0.17	6.1-7.3	<2	Moderate	0.24	2	6	1-3
	5-21	35-50	1.20-1.40	0.06-0.2	0.12-0.16	6.1-7.8	<2	High	0.15			
	21-32	35-50	1.20-1.40	0.06-0.2	0.08-0.12	6.1-7.8	<2	Moderate	0.10			
	32	---	---	---	---	---	---	---	---			
22*:												
Parkay	0-10	10-25	1.40-1.50	0.6-2.0	0.13-0.15	6.1-7.3	<2	Low	0.32	1	5	2-3
	10-19	10-25	1.50-1.60	0.6-2.0	0.08-0.12	6.1-7.3	<2	Low	0.15			
	19-45	27-35	1.40-1.50	0.2-0.6	0.05-0.09	6.1-7.3	<2	Low	0.15			
	45	---	---	---	---	---	---	---	---			
Wickahoney	0-4	16-20	1.40-1.50	0.6-2.0	0.05-0.07	6.1-7.3	<2	Low	0.15	1	8	1-3
	4-6	25-35	1.45-1.55	0.2-0.6	0.12-0.14	6.1-7.8	<2	Moderate	0.20			
	6-16	35-55	1.20-1.40	0.06-0.2	0.08-0.14	6.1-7.8	<2	High	0.10			
	16	---	---	---	---	---	---	---	---			
Boulder Lake	0-17	60-80	1.20-1.30	<0.06	0.14-0.15	6.1-7.3	<2	High	0.20	5	8	1-2
	17-72	60-80	1.20-1.40	<0.06	0.14-0.15	6.6-8.4	<2	High	0.20			
23	0-12	10-20	1.40-1.50	0.6-2.0	0.12-0.15	5.6-7.3	<2	Low	0.20	5	6	2-4
Paynecreek	12-45	24-34	1.40-1.50	0.2-0.6	0.15-0.18	6.6-7.8	<2	Moderate	0.17			
	45-84	0-5	1.60-1.70	6.0-20	0.03-0.06	5.6-7.3	<2	Low	0.02			
24	0-17	10-20	1.40-1.50	0.6-2.0	0.12-0.15	5.6-7.3	<2	Low	0.20	5	6	2-4
Paynecreek	17-38	24-34	1.40-1.50	0.2-0.6	0.15-0.18	6.6-7.8	<2	Moderate	0.17			
	38-50	10-20	1.55-1.65	2.0-6.0	0.06-0.09	6.6-7.8	<2	Low	0.10			
	50-84	0-5	1.60-1.70	6.0-20	0.03-0.06	5.6-7.3	<2	Low	0.02			
25*:												
Paynecreek	0-17	10-20	1.40-1.50	0.6-2.0	0.12-0.15	5.6-7.3	<2	Low	0.20	5	6	2-4
	17-38	24-34	1.40-1.50	0.2-0.6	0.15-0.18	6.6-7.8	<2	Moderate	0.17			
	38-50	10-20	1.55-1.65	2.0-6.0	0.06-0.09	6.6-7.8	<2	Low	0.10			
	50-84	0-5	1.60-1.70	6.0-20	0.03-0.06	5.6-7.3	<2	Low	0.02			
Thacker	0-4	15-27	1.40-1.50	0.6-2.0	0.17-0.20	6.1-7.3	<2	Moderate	0.43	1	6	1-2
	4-12	20-35	1.45-1.60	0.2-0.6	0.14-0.17	6.1-7.3	<2	Moderate	0.32			
	12-21	50-60	1.20-1.40	<0.06	0.16-0.18	6.1-7.8	<2	High	0.20			
	21-30	---	---	---	---	---	---	---	---			
	30-84	0-5	---	>20	0.02-0.04	7.4-7.8	<2	Low	0.02			
26*:												
Petan	0-10	18-27	1.40-1.50	0.6-2.0	0.10-0.12	6.1-7.8	<2	Low	0.10	1	8	2-3
	10-17	40-60	1.25-1.40	<0.06	0.08-0.10	6.1-7.8	<2	Moderate	0.10			
	17-21	---	---	---	---	---	---	---	---			
	21	---	---	---	---	---	---	---	---			
Deunah	0-4	15-27	1.20-1.40	0.6-2.0	0.16-0.20	5.6-7.3	<2	Moderate	0.43	1	6	1-2
	4-9	18-35	1.30-1.50	0.2-0.6	0.18-0.20	6.1-7.3	<2	Moderate	0.43			
	9-19	60-70	1.25-1.45	<0.06	0.12-0.15	6.6-7.8	<2	High	0.20			
	19-23	20-30	1.30-1.50	0.2-0.6	0.18-0.19	7.4-7.8	<2	Moderate	0.32			
	23-28	---	---	---	---	---	---	---	---			
	28	---	---	---	---	---	---	---	---			

See footnote at end of table.

TABLE 15.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Salinity	Shrink-swell potential	Erosion factors		Wind erodibility group	Organic matter
									K	T		
	In	Pct	G/cm3	In/hr	In/in	pH	mmhos/cm					Pct
26*:												
Hatpeak----------	0-16	16-24	1.40-1.50	0.6-2.0	0.19-0.21	6.1-7.3	<2	Moderate	0.43	3	5	1-3
	16-24	28-38	1.40-1.50	0.2-0.6	0.19-0.21	6.1-7.3	<2	Moderate	0.43			
	24-34	40-50	1.20-1.35	0.06-0.2	0.14-0.16	6.6-7.8	<2	High------	0.20			
	34-41	---	---	---	---	---	---	----------	----			
	41	---	---	---	---	---	---	----------	----			
27*:												
Rubble land.												
Deunah----------	0-4	15-27	1.20-1.40	0.6-2.0	0.16-0.20	5.6-7.3	<2	Moderate	0.43	1	6	1-2
	4-9	18-35	1.30-1.50	0.2-0.6	0.18-0.20	6.1-7.3	<2	Moderate	0.43			
	9-19	60-70	1.25-1.45	<0.06	0.12-0.15	6.6-7.8	<2	High------	0.20			
	19-23	20-30	1.30-1.50	0.2-0.6	0.18-0.19	7.4-7.8	<2	Moderate	0.32			
	23-28	---	---	---	---	---	---	----------	----			
	28	---	---	---	---	---	---	----------	----			
28*:												
Rubble land.												
Rock outcrop.												
Argixerolls.												
29*:												
Searla----------	0-15	12-20	1.40-1.50	0.6-2.0	0.13-0.16	6.6-7.3	<2	Low-------	0.15	2	6	2-4
	15-32	27-35	1.40-1.50	0.2-0.6	0.10-0.13	6.6-7.3	<2	Low-------	0.10			
	32-60	10-22	1.50-1.60	0.6-2.0	0.05-0.09	7.4-8.4	<2	Low-------	0.05			
Povey-----------	0-10	10-18	1.20-1.40	0.6-2.0	0.10-0.14	6.1-7.3	<2	Low-------	0.17	4	5	2-4
	10-46	10-18	1.20-1.40	0.6-2.0	0.09-0.12	6.6-8.4	<2	Low-------	0.15			
	46-60	10-18	1.25-1.45	2.0-6.0	0.05-0.07	6.6-7.8	<2	Low-------	0.10			
30---------------	0-18	8-14	1.40-1.50	2.0-6.0	0.10-0.13	6.1-7.3	<2	Low-------	0.15	4	3	1-2
Simonton	18-35	18-32	1.45-1.60	0.6-2.0	0.13-0.16	6.1-7.3	<2	Low-------	0.15			
	35-59	2-8	1.60-1.70	6.0-20	0.05-0.08	6.6-7.3	<2	Low-------	0.05			
	59-84	15-25	1.50-1.60	0.6-2.0	0.16-0.18	6.6-7.3	<2	Low-------	0.37			
31*:												
Simonton--------	0-18	8-14	1.40-1.50	2.0-6.0	0.10-0.13	6.1-7.3	<2	Low-------	0.15	4	3	1-2
	18-35	18-32	1.45-1.60	0.6-2.0	0.13-0.16	6.1-7.3	<2	Low-------	0.15			
	35-59	2-8	1.60-1.70	6.0-20	0.05-0.08	6.6-7.3	<2	Low-------	0.05			
	59-84	15-25	1.50-1.60	0.6-2.0	0.16-0.18	6.6-7.3	<2	Low-------	0.37			
Bluecreek-------	0-11	15-20	1.55-1.65	2.0-6.0	0.10-0.11	6.1-7.3	<2	Low-------	0.24	1	3	1-2
	11-20	35-50	1.20-1.40	0.06-0.2	0.15-0.18	6.1-7.8	<2	High------	0.20			
	20-26	10-25	1.40-1.50	2.0-6.0	0.08-0.15	6.1-9.0	<2	Low-------	0.15			
	26-44	---	---	---	---	---	---	----------	----			
	44-84	0-8	1.60-1.70	>6.0	0.03-0.05	6.6-7.8	<2	Low-------	0.05			
32*, 33*:												
Simonton--------	0-15	8-14	1.40-1.50	2.0-6.0	0.10-0.13	6.1-7.3	<2	Low-------	0.15	4	3	1-2
	15-41	18-32	1.40-1.55	0.6-2.0	0.09-0.12	6.1-7.3	<2	Low-------	0.10			
	41-80	2-8	1.60-1.70	>6.0	0.02-0.06	6.6-7.3	<2	Low-------	0.05			
	80-84	15-25	1.50-1.60	0.6-2.0	0.16-0.18	6.6-7.3	<2	Low-------	0.37			
Thacker---------	0-4	15-27	1.40-1.50	0.6-2.0	0.17-0.20	6.1-7.3	<2	Moderate	0.43	1	6	1-2
	4-12	20-35	1.45-1.60	0.2-0.6	0.14-0.17	6.1-7.3	<2	Moderate	0.32			
	12-21	50-60	1.20-1.40	<0.06	0.16-0.18	6.1-7.8	<2	High------	0.20			
	21-30	---	---	---	---	---	---	----------	----			
	30-84	0-5	---	>20	0.02-0.04	7.4-7.8	<2	Low-------	0.02			
34---------------	0-6	10-20	1.40-1.50	0.6-2.0	0.19-0.21	6.6-7.8	<2	Low-------	0.43	3	5	2-4
Soonahbe	6-31	22-32	1.40-1.60	0.2-0.6	0.17-0.20	6.1-7.8	<2	Moderate	0.37			
	31-46	8-15	1.50-1.60	0.6-2.0	0.17-0.20	6.6-8.4	<2	Low-------	0.43			
	46-59	---	---	---	---	---	---	----------	----			
	59-80	8-15	1.50-1.60	0.6-2.0	0.17-0.20	7.4-9.0	2-4	Low-------	0.43			
	80-84	0-5	1.60-1.70	>6.0	0.04-0.06	7.4-9.0	<2	Low-------	0.02			

See footnote at end of table.

TABLE 15.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Salinity	Shrink-swell potential	Erosion factors		Wind erodibility group	Organic matter
									K	T		
	In	Pct	G/cm^3	In/hr	In/in	pH	mmhos/cm					Pct
35*:												
Soonahbe	0-6	10-20	1.40-1.50	0.6-2.0	0.19-0.21	6.6-7.8	<2	Low	0.43	3	5	2-4
	6-31	22-32	1.40-1.60	0.2-0.6	0.17-0.20	6.1-7.8	<2	Moderate	0.37			
	31-46	8-15	1.50-1.60	0.6-2.0	0.17-0.20	6.6-8.4	<2	Low	0.43			
	46-59	---	---	---	---	---	---	---	---			
	59-80	8-15	1.50-1.60	0.6-2.0	0.17-0.20	7.4-9.0	2-4	Low	0.43			
	80-84	0-5	1.60-1.70	>6.0	0.04-0.06	7.4-9.0	<2	Low	0.02			
Thacker	0-4	15-27	1.40-1.50	0.6-2.0	0.17-0.20	6.1-7.3	<2	Moderate	0.43	1	6	1-2
	4-12	20-35	1.45-1.60	0.2-0.6	0.14-0.17	6.1-7.3	<2	Moderate	0.32			
	12-21	50-60	1.20-1.40	<0.06	0.16-0.18	6.1-7.8	<2	High	0.20			
	21-30	---	---	---	---	---	---	---	---			
	30-84	0-5	---	>20	0.02-0.04	7.4-7.8	<2	Low	0.02			
36*:												
Soonahbe Variant	0-3	5-15	1.35-1.50	2.0-6.0	0.13-0.15	6.6-7.3	<2	Low	0.43	2	3	1-2
	3-21	18-27	1.40-1.55	0.6-2.0	0.15-0.18	6.6-7.3	<2	Moderate	0.37			
	21-28	10-25	1.30-1.50	0.6-6.0	0.06-0.10	6.6-7.8	<2	Low	0.24			
	28	---	---	---	---	---	---	---	---			
Bulake	0-2	5-15	1.40-1.50	2.0-6.0	0.13-0.15	6.6-7.3	<2	Low	0.37	1	3	1-2
	2-8	10-27	1.50-1.60	0.6-2.0	0.15-0.18	6.6-7.3	<2	Moderate	0.32			
	8-15	40-50	1.20-1.40	0.06-0.2	0.14-0.17	6.6-7.3	<2	High	0.24			
	15	---	---	---	---	---	---	---	---			
37*:												
Strickland	0-13	15-23	1.40-1.50	0.6-2.0	0.15-0.18	5.1-6.5	<2	Low	0.32	2	6	4-8
	13-28	18-27	1.50-1.60	0.6-2.0	0.11-0.15	5.1-6.5	<2	Moderate	0.28			
	28	---	---	---	---	---	---	---	---			
Bluebell	0-17	8-15	1.20-1.30	0.6-2.0	0.15-0.18	5.6-6.5	<2	Low	0.32	2	5	2-5
	17-22	18-25	1.20-1.30	0.6-2.0	0.15-0.18	5.6-6.5	<2	Low	0.32			
	22-29	27-35	1.40-1.50	0.2-0.6	0.09-0.11	5.6-6.5	<2	Moderate	0.17			
	29	---	---	---	---	---	---	---	---			
38	0-4	15-27	1.40-1.50	0.6-2.0	0.17-0.20	6.1-7.3	<2	Moderate	0.43	1	6	1-2
Thacker	4-12	20-35	1.45-1.60	0.2-0.6	0.14-0.17	6.1-7.3	<2	Moderate	0.32			
	12-21	50-60	1.20-1.40	<0.06	0.16-0.18	6.1-7.8	<2	High	0.20			
	21-30	---	---	---	---	---	---	---	---			
	30-84	0-5	---	>20	0.02-0.04	7.4-7.8	<2	Low	0.02			
39	0-4	15-27	1.40-1.50	0.6-2.0	0.15-0.18	6.1-7.3	<2	Moderate	0.32	1	6	1-2
Thacker	4-12	20-35	1.45-1.60	0.2-0.6	0.14-0.17	6.1-7.3	<2	Moderate	0.32			
	12-21	50-60	1.20-1.40	<0.06	0.16-0.18	6.1-7.8	<2	High	0.20			
	21-30	---	---	---	---	---	---	---	---			
	30-84	0-5	---	>20	0.02-0.04	7.4-7.8	<2	Low	0.02			
40*, 41*:												
Thacker	0-4	15-27	1.40-1.50	0.6-2.0	0.17-0.20	6.1-7.3	<2	Moderate	0.43	1	6	1-2
	4-12	20-35	1.45-1.60	0.2-0.6	0.14-0.17	6.1-7.3	<2	Moderate	0.32			
	12-21	50-60	1.20-1.40	<0.06	0.16-0.18	6.1-7.8	<2	High	0.20			
	21-30	---	---	---	---	---	---	---	---			
	30-84	0-5	---	>20	0.02-0.04	7.4-7.8	<2	Low	0.02			
Simonton	0-15	8-14	1.40-1.50	2.0-6.0	0.10-0.13	6.1-7.3	<2	Low	0.15	4	3	1-2
	15-41	18-32	1.40-1.55	0.6-2.0	0.09-0.12	6.1-7.3	<2	Low	0.10			
	41-80	2-8	1.60-1.70	>6.0	0.02-0.06	6.6-7.3	<2	Low	0.05			
	80-84	15-25	1.50-1.60	0.6-2.0	0.16-0.18	6.6-7.3	<2	Low	0.37			
42*:												
Thacker	0-4	15-27	1.40-1.50	0.6-2.0	0.17-0.20	6.1-7.3	<2	Moderate	0.43	1	6	1-2
	4-12	20-35	1.45-1.60	0.2-0.6	0.14-0.17	6.1-7.3	<2	Moderate	0.32			
	12-21	50-60	1.20-1.40	<0.06	0.16-0.18	6.1-7.8	<2	High	0.20			
	21-30	---	---	---	---	---	---	---	---			
	30-84	0-5	---	>20	0.02-0.04	7.4-7.8	<2	Low	0.02			

See footnote at end of table.

TABLE 15.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Salinity	Shrink-swell potential	Erosion factors		Wind erodibility group	Organic matter
									K	T		
	In	Pct	G/cm3	In/hr	In/in	pH	mmhos/cm					Pct
42*:												
Soonahbe--------	0-6	10-20	1.40-1.50	0.6-2.0	0.19-0.21	6.6-7.8	<2	Low-------	0.43	3	5	2-4
	6-31	22-32	1.40-1.60	0.2-0.6	0.17-0.20	6.1-7.8	<2	Moderate	0.37			
	31-46	8-15	1.50-1.60	0.6-2.0	0.17-0.20	6.6-8.4	<2	Low-------	0.43			
	46-59	---	---	---	---	---	---	----------	----			
	59-80	8-15	1.50-1.60	0.6-2.0	0.17-0.20	7.4-9.0	2-4	Low-------	0.43			
	80-84	0-5	1.60-1.70	>6.0	0.04-0.06	7.4-9.0	<2	Low-------	0.02			
43*:												
Thacker---------	0-4	15-27	1.40-1.50	0.6-2.0	0.17-0.20	6.1-7.3	<2	Moderate	0.43	1	6	1-2
	4-12	20-35	1.45-1.60	0.2-0.6	0.14-0.17	6.1-7.3	<2	Moderate	0.32			
	12-21	50-60	1.20-1.40	<0.06	0.16-0.18	6.1-7.8	<2	High------	0.20			
	21-30	---	---	---	---	---	---	----------	----			
	30-84	0-5	---	>20	0.02-0.04	7.4-7.8	<2	Low-------	0.02			
Yatahoney-------	0-4	20-25	1.20-1.40	0.6-2.0	0.15-0.18	6.1-7.3	<2	Low-------	0.43	2	6	1-2
	4-9	25-35	1.30-1.50	0.2-0.6	0.13-0.18	6.1-7.8	<2	Moderate	0.32			
	9-25	40-55	1.25-1.45	0.06-0.2	0.14-0.16	6.6-8.4	<2	High------	0.28			
	25-32	---	---	---	---	---	---	----------	----			
	32	---	---	---	---	---	---	----------	----			
44----------	0-4	28-35	1.30-1.40	0.2-0.6	0.18-0.21	6.1-7.8	<2	Moderate	0.43	5	7	2-4
Tucker	4-59	30-50	1.40-1.50	0.06-0.2	0.15-0.17	6.6-7.3	<2	High------	0.43			
	59-84	30-40	1.40-1.50	0.2-0.6	0.18-0.21	6.6-8.4	<4	High------	0.43			
45----------	0-6	28-35	1.35-1.45	0.2-0.6	0.18-0.21	6.1-7.8	<2	Moderate	0.43	1	7	2-4
Tucker	6-22	30-50	1.20-1.35	0.06-0.2	0.15-0.21	6.6-7.8	<2	High------	0.43			
	22-46	20-30	1.40-1.50	0.2-0.6	0.17-0.21	6.6-7.8	<2	Moderate	0.37			
	46-84	0-8	1.60-1.70	>6.0	0.03-0.06	6.6-8.4	<2	Low-------	0.05			
46----------	0-5	27-33	1.35-1.45	0.2-0.6	0.18-0.21	6.1-7.3	<2	Moderate	0.37	1	7	2-4
Tucker Variant	5-23	35-50	1.35-1.50	0.06-0.6	0.15-0.17	6.6-7.8	<2	High------	0.43			
	23-27	30-40	1.40-1.50	0.2-0.6	0.18-0.21	7.4-7.8	<2	High------	0.37			
	27-60	0-5	1.60-1.70	>20.0	0.03-0.04	6.6-7.8	<2	Low-------	0.10			
47*:												
Watchabob-------	0-15	8-15	1.45-1.50	2.0-6.0	0.08-0.11	5.6-7.3	<2	Low-------	0.15	2	3	2-4
	15-26	18-30	1.50-1.65	0.6-2.0	0.07-0.14	5.6-7.3	<2	Moderate	0.15			
	26-28	5-15	1.55-1.65	6.0-20	0.03-0.06	5.1-5.5	<2	Low-------	0.05			
	28	---	---	---	---	---	---	----------	----			
Bearskin Variant	0-8	10-22	1.40-1.50	0.6-2.0	0.16-0.18	6.1-6.5	<2	Low-------	0.28	1	5	1-3
	8-12	20-30	1.40-1.50	0.2-0.6	0.15-0.17	6.1-6.5	<2	Moderate	0.15			
	12-16	20-30	1.40-1.50	0.2-0.6	0.11-0.13	6.1-6.5	<2	Moderate	0.10			
	16	---	---	---	---	---	---	----------	----			
48----------	0-5	16-20	1.40-1.50	0.6-2.0	0.13-0.15	6.1-7.3	<2	Low-------	0.20	1	5	1-3
Wickahoney	5-13	25-35	1.45-1.55	0.2-0.6	0.12-0.14	6.1-7.8	<2	Moderate	0.20			
	13-18	35-55	1.20-1.40	0.06-0.2	0.08-0.14	6.1-7.8	<2	High------	0.10			
	18	---	---	---	---	---	---	----------	----			
49*:												
Wickahoney------	0-4	16-20	1.40-1.50	0.6-2.0	0.05-0.07	6.1-7.3	<2	Low-------	0.15	1	8	1-3
	4-6	25-35	1.45-1.55	0.2-0.6	0.12-0.14	6.1-7.8	<2	Moderate	0.20			
	6-16	35-55	1.20-1.40	0.06-0.2	0.08-0.14	6.1-7.8	<2	High------	0.10			
	16	---	---	---	---	---	---	----------	----			
Blackleg--------	0-13	16-26	1.40-1.50	0.6-2.0	0.12-0.16	6.1-7.3	<2	Low-------	0.24	2	5	3-4
	13-23	30-50	1.20-1.40	0.06-0.2	0.12-0.16	6.1-7.3	<2	Moderate	0.15			
	23-36	35-60	1.20-1.40	0.06-0.2	0.09-0.12	6.6-7.8	<2	High------	0.10			
	36-50	---	---	---	---	---	---	----------	----			
50*:												
Wickahoney------	0-4	16-20	1.40-1.50	0.6-2.0	0.05-0.07	6.1-7.3	<2	Low-------	0.15	1	8	1-3
	4-6	25-35	1.45-1.55	0.2-0.6	0.12-0.14	6.1-7.8	<2	Moderate	0.20			
	6-16	35-55	1.20-1.40	0.06-0.2	0.08-0.14	6.1-7.8	<2	High------	0.10			
	16	---	---	---	---	---	---	----------	----			

See footnote at end of table.

TABLE 15.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Salinity	Shrink-swell potential	Erosion factors		Wind erodibility group	Organic matter
									K	T		
	In	Pct	G/cm^3	In/hr	In/in	pH	mmhos/cm					Pct
50*:												
Wagonbox--------	0-5	27-32	1.35-1.45	0.2-0.6	0.04-0.06	6.1-7.3	<2	Low-------	0.05	1	8	1-2
	5-17	35-55	1.20-1.40	0.06-0.2	0.11-0.14	6.1-7.8	<2	High------	0.10			
	17-23	---	---	---	---	---	---	----------	----			
	23	---	---	---	---	---	---	----------	----			
51*:												
Yatahoney-------	0-4	20-25	1.20-1.40	0.6-2.0	0.10-0.15	6.1-7.3	<2	Low-------	0.28	2	6	1-2
	4-20	40-55	1.25-1.45	0.06-0.2	0.14-0.16	6.6-8.4	<2	High------	0.28			
	20-40	---	---	---	---	---	---	----------	----			
Blackleg--------	0-4	15-25	1.40-1.50	0.6-2.0	0.11-0.17	6.1-7.3	<2	Low-------	0.20	2	8	2-5
	4-15	27-35	1.40-1.50	0.2-0.6	0.15-0.20	6.1-7.3	<2	Moderate	0.20			
	15-24	40-55	1.20-1.40	0.06-0.2	0.06-0.09	6.6-8.4	<2	Moderate	0.05			
	24-37	40-55	1.20-1.40	0.06-0.2	0.12-0.14	6.6-7.8	<2	High------	0.05			
	37-60	---	---	---	---	---	---	----------	----			
52*:												
Yatahoney-------	0-4	20-25	1.20-1.40	0.6-2.0	0.15-0.18	6.1-7.3	<2	Low-------	0.43	2	6	1-2
	4-9	25-35	1.30-1.50	0.2-0.6	0.13-0.18	6.1-7.8	<2	Moderate	0.32			
	9-25	40-55	1.25-1.45	0.06-0.2	0.14-0.16	6.6-8.4	<2	High------	0.28			
	25-32	---	---	---	---	---	---	----------	----			
	32	---	---	---	---	---	---	----------	----			
Soonahbe--------	0-5	10-20	1.40-1.50	0.6-2.0	0.19-0.21	6.6-7.8	<2	Low-------	0.43	3	5	2-4
	5-46	22-32	1.40-1.60	0.2-0.6	0.17-0.20	6.1-7.8	<2	Moderate	0.37			
	46-70	---	---	---	---	---	---	----------	----			
53, 54----------	0-16	14-27	1.40-1.50	0.6-2.0	0.16-0.18	6.6-7.8	<2	Moderate	0.32	5	5	2-4
Zola	16-28	30-36	1.35-1.45	0.2-0.6	0.19-0.21	7.4-8.4	2-4	Moderate	0.32			
	28-65	18-26	1.50-1.60	0.6-2.0	0.16-0.18	6.6-7.8	<2	Moderate	0.37			
	65-73	0-5	1.60-1.70	6.0-20	0.04-0.06	6.6-7.8	<2	Low-------	0.05			
	73-84	28-40	1.40-1.50	0.2-0.6	0.19-0.21	6.6-7.8	<2	High------	0.28			
55*:												
Zola----------	0-16	14-27	1.40-1.50	0.6-2.0	0.16-0.18	6.6-7.8	<2	Moderate	0.32	5	5	2-4
	16-28	30-36	1.35-1.45	0.2-0.6	0.19-0.21	7.4-8.4	2-4	Moderate	0.32			
	28-65	18-26	1.50-1.60	0.6-2.0	0.16-0.18	6.6-7.8	<2	Moderate	0.37			
	65-73	0-5	1.60-1.70	6.0-20	0.04-0.06	6.6-7.8	<2	Low-------	0.05			
	73-84	28-40	1.40-1.50	0.2-0.6	0.19-0.21	6.6-7.8	<2	High------	0.28			
Hayspur---------	0-4	28-35	1.20-1.35	0.2-0.6	0.17-0.20	7.4-8.4	<4	Moderate	0.37	5	4L	2-4
	4-59	20-35	1.40-1.60	0.2-0.6	0.17-0.20	7.4-8.4	2-4	Moderate	0.37			
	59-84	5-10	1.60-1.70	6.0-20	0.04-0.06	7.4-8.4	<2	Low-------	0.10			

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 16.--WATER FEATURES

["Flooding" and "water table" and terms such as "rare," "brief," "apparent," and "perched" are explained in the text. The symbol < means less than; > means more than. Absence of an entry indicates that the feature is not a concern or that data were not estimated]

Soil name and map symbol	Hydrologic group	Flooding			High water table		
		Frequency	Duration	Months	Depth **	Kind	Months
					Ft		
1*:							
Bedstead	C	None	---	---	>6.0	---	---
Arbidge	C	None	---	---	>6.0	---	---
2*:							
Blackfoot	C	Frequent	Long	Mar-May	1.5-3.0	Apparent	Mar-Jun
Tucker	C	Frequent	Long	Mar-May	1.5-3.0	Apparent	Mar-Jun
3*:							
Bluecreek	C	None	---	---	>6.0	---	---
Thacker	D	None	---	---	>6.0	---	---
4*:							
Bluecreek Variant	D	Frequent	Long	Mar-Jun	3.0-5.0	Apparent	Mar-Jun
Paynecreek Variant	B	None	---	---	>6.0	---	---
5*:							
Boulder Lake	D	Frequent	Long	Mar-Jun	1.5-3.0	Perched	Mar-Jun
Tucker	C	Frequent	Long	Mar-May	1.5-3.0	Apparent	Mar-Jun
6*:							
Bulake	D	None	---	---	>6.0	---	---
Deunah	D	None	---	---	>6.0	---	---
7*:							
Burmah Variant	D	Rare	---	---	>6.0	---	---
Torney Variant	C	Rare	---	---	>6.0	---	---
Yatahoney	C	None	---	---	>6.0	---	---
8*:							
Cavanaugh	C	None	---	---	>6.0	---	---
Obray	D	None	---	---	>6.0	---	---
9*:							
Cavanaugh	C	None	---	---	>6.0	---	---
Sattley	B	None	---	---	>6.0	---	---
10*:							
Crooked Creek	D	Rare	---	---	+2-1.0	Apparent	Oct-Jul
Bear Lake	D	Rare	---	---	+1-1.0	Apparent	Nov-Jun
11--- Deunah	D	None	---	---	>6.0	---	---
12--- Disabel Variant	D	Occasional	Brief	Mar-May	>6.0	---	---
13*:							
Disabel Variant	D	Occasional	Brief	Mar-May	>6.0	---	---
Bluecreek	C	None	---	---	>6.0	---	---

See footnotes at end of table.

TABLE 16.--WATER FEATURES--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table		
		Frequency	Duration	Months	Depth **	Kind	Months
					Ft		
14*:							
Dranyon	B	None	---	---	>6.0	---	---
Strickland	C	None	---	---	>6.0	---	---
Parkay	B	None	---	---	>6.0	---	---
15*:							
Haploxeralfs.							
Durixeralfs.							
Rubble land.							
16--- Hayspur	D	Frequent	Long	Mar-Jun	+1-1.0	Apparent	Mar-Jun
17*:							
Hayspur	D	Frequent	Long	Mar-Jun	+1-1.0	Apparent	Mar-Jun
Blackfoot	C	Rare	---	---	1.5-3.0	Apparent	Mar-May
18*:							
Hayspur	D	Frequent	Long	Mar-Jun	+1-1.0	Apparent	Mar-Jun
Zola	C	Frequent	Long	Mar-Jun	3.0-5.0	Apparent	Mar-Jun
Paynecreek	B	None	---	---	>6.0	---	---
19*:							
Lasauses Variant	D	None	---	---	+.5-1.5	Apparent	Nov-Jun
Boulder Lake	D	None	---	---	+1-1.5	Perched	Dec-Jun
20*:							
Moonstone	C	None	---	---	>6.0	---	---
Earcree	B	None	---	---	>6.0	---	---
21*:							
Parkay	B	None	---	---	>6.0	---	---
Dranyon	B	None	---	---	>6.0	---	---
Cavanaugh	C	None	---	---	>6.0	---	---
22*:							
Parkay	B	None	---	---	>6.0	---	---
Wickahoney	D	None	---	---	>6.0	---	---
Boulder Lake	D	Frequent	Long	Mar-Jun	1.5-3.0	Perched	Mar-Jun
23, 24--- Paynecreek	B	None	---	---	>6.0	---	---
25*:							
Paynecreek	B	None	---	---	>6.0	---	---
Thacker	D	None	---	---	>6.0	---	---
26*:							
Petan	D	None	---	---	>6.0	---	---
Deunah	D	None	---	---	>6.0	---	---
Hatpeak	C	None	---	---	>6.0	---	---

See footnotes at end of table.

TABLE 16.--WATER FEATURES--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table		
		Frequency	Duration	Months	Depth ** Ft	Kind	Months
27*: Rubble land. Deunah	D	None	---	---	>6.0	---	---
28*: Rubble land. Rock outcrop. Argixerolls.							
29*: Searla	B	None	---	---	>6.0	---	---
Povey	B	None	---	---	>6.0	---	---
30--- Simonton	B	None	---	---	>6.0	---	---
31*: Simonton	B	None	---	---	>6.0	---	---
Bluecreek	C	None	---	---	>6.0	---	---
32*, 33*: Simonton	B	None	---	---	>6.0	---	---
Thacker	D	None	---	---	>6.0	---	---
34--- Soonahbe	B	None	---	---	>6.0	---	---
35*: Soonahbe	B	None	---	---	>6.0	---	---
Thacker	D	None	---	---	>6.0	---	---
36*: Soonahbe Variant	C	None	---	---	>6.0	---	---
Bulake	D	None	---	---	>6.0	---	---
37*: Strickland	C	None	---	---	>6.0	---	---
Bluebell	C	None	---	---	>6.0	---	---
38, 39--- Thacker	D	None	---	---	>6.0	---	---
40*, 41*: Thacker	D	None	---	---	>6.0	---	---
Simonton	B	None	---	---	>6.0	---	---
42*: Thacker	D	None	---	---	>6.0	---	---
Soonahbe	B	None	---	---	>6.0	---	---
43*: Thacker	D	None	---	---	>6.0	---	---
Yatahoney	C	None	---	---	>6.0	---	---
44--- Tucker	C	Frequent	Long	Mar-May	1.5-3.0	Apparent	Mar-Jun

See footnotes at end of table.

TABLE 16.--WATER FEATURES--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table		
		Frequency	Duration	Months	Depth **	Kind	Months
					Ft		
45--Tucker	C	Frequent	Long	Mar-May	1.5-3.0	Apparent	Mar-Jun
46--Tucker Variant	C	Frequent	Long	Feb-May	1.5-3.0	Apparent	Mar-Jun
47*:							
Watchabob	C	None	---	---	>6.0	---	---
Bearskin Variant	D	None	---	---	>6.0	---	---
48--Wickahoney	D	None	---	---	>6.0	---	---
49*:							
Wickahoney	D	None	---	---	>6.0	---	---
Blackleg	C	None	---	---	>6.0	---	---
50*:							
Wickahoney	D	None	---	---	>6.0	---	---
Wagonbox	D	None	---	---	>6.0	---	---
51*:							
Yatahoney	C	None	---	---	>6.0	---	---
Blackleg	C	None	---	---	>6.0	---	---
52*:							
Yatahoney	C	None	---	---	>6.0	---	---
Soonahbe	B	None	---	---	>6.0	---	---
53--Zola	C	Rare	---	---	3.0-5.0	Apparent	Mar-Jun
54--Zola	C	Frequent	Long	Mar-Jun	3.0-5.0	Apparent	Mar-Jun
55*:							
Zola	C	Rare	---	---	3.0-5.0	Apparent	Mar-Jun
Hayspur	D	Frequent	Long	Mar-Jun	+1-1.0	Apparent	Mar-Jun

* See description of the map unit for composition and behavior characteristics of the map unit.
** In the "High water table--Depth" column, a plus sign preceding the range in depth indicates that the water table is above the surface of the soil. The first numeral in the range indicates how high the water rises above the surface. The second numeral indicates the depth below the surface.

TABLE 17.--SOIL FEATURES

[The symbol > means more than. Absence of an entry indicates that the feature is not a concern or that data were not estimated]

Soil name and map symbol	Bedrock		Cemented pan		Potential frost action	Risk of corrosion	
	Depth	Hardness	Depth	Hardness		Uncoated steel	Concrete
	In		In				
1*:							
Bedstead	22-40	Hard	21-36	Thin	Moderate	Moderate	Low.
Arbidge	>60	---	20-40	Thin	Moderate	High	Low.
2*:							
Blackfoot	>60	---	---	---	High	High	Low.
Tucker	>60	---	---	---	High	High	Low.
3*:							
Bluecreek	>60	---	20-40	Thick	Moderate	High	Low.
Thacker	>60	---	20-40	Thin	Moderate	Moderate	Low.
4*:							
Bluecreek Variant	>60	---	---	---	Moderate	High	Low.
Paynecreek Variant	>60	---	---	---	Moderate	High	Low.
5*:							
Boulder Lake	>60	---	---	---	Moderate	High	Low.
Tucker	>60	---	---	---	High	High	Low.
6*:							
Bulake	14-20	Hard	---	---	Moderate	Moderate	Low.
Deunah	23-40	Hard	22-32	Thick	Moderate	Moderate	Moderate.
7*:							
Burmah Variant	>60	---	---	---	Moderate	Moderate	Moderate.
Torney Variant	>60	---	---	---	High	Moderate	Low.
Yatahoney	24-40	Hard	20-38	Thick	Moderate	High	Low.
8*:							
Cavanaugh	20-40	Hard	---	---	Moderate	Moderate	Low.
Obray	>60	---	---	---	Moderate	High	Low.
9*:							
Cavanaugh	20-40	Hard	---	---	Moderate	Moderate	Low.
Sattley	40-60	Hard	---	---	Moderate	Moderate	Low.
10*:							
Crooked Creek	>60	---	---	---	High	High	Moderate.
Bear Lake	>60	---	---	---	High	High	Low.
11--Deunah	22-40	Hard	20-34	Thick	Moderate	Moderate	Moderate.
12--Disabel Variant	>60	---	---	---	Moderate	High	Low.
13*:							
Disabel Variant	>60	---	---	---	Moderate	High	Low.
Bluecreek	>60	---	20-40	Thick	Moderate	High	Low.

See footnote at end of table.

TABLE 17.--SOIL FEATURES--Continued

Soil name and map symbol	Bedrock		Cemented pan		Potential frost action	Risk of corrosion	
	Depth	Hardness	Depth	Hardness		Uncoated steel	Concrete
	In		In				
14*:							
Dranyon	40-60	Hard	---	---	Moderate	Moderate	Moderate.
Strickland	20-40	Hard	---	---	Moderate	Moderate	Moderate.
Parkay	40-60	Soft	---	---	Moderate	Moderate	Low.
15*:							
Haploxeralfs.							
Durixeralfs.							
Rubble land.							
16--- Hayspur	>60	---	---	---	High	High	Low.
17*:							
Hayspur	>60	---	---	---	High	High	Low.
Blackfoot	>60	---	---	---	High	High	Low.
18*:							
Hayspur	>60	---	---	---	High	High	Low.
Zola	>60	---	---	---	Moderate	High	Low.
Paynecreek	>60	---	---	---	Moderate	Moderate	Moderate.
19*:							
Lasauses Variant	>60	---	---	---	High	High	Low.
Boulder Lake	>60	---	---	---	Moderate	High	Low.
20*:							
Moonstone	20-40	Soft	---	---	Moderate	Moderate	Low.
Earcree	>60	---	---	---	Moderate	Moderate	Moderate.
21*:							
Parkay	40-60	Soft	---	---	Moderate	Moderate	Low.
Dranyon	40-60	Hard	---	---	Moderate	Moderate	Moderate.
Cavanaugh	20-40	Hard	---	---	Moderate	Moderate	Low.
22*:							
Parkay	40-60	Soft	---	---	Moderate	Moderate	Low.
Wickahoney	10-20	Hard	---	---	Moderate	Moderate	Low.
Boulder Lake	>60	---	---	---	Moderate	High	Low.
23, 24--- Paynecreek	>60	---	---	---	Moderate	Moderate	Moderate.
25*:							
Paynecreek	>60	---	---	---	Moderate	Moderate	Moderate.
Thacker	>60	---	20-40	Thin	Moderate	Moderate	Low.
26*:							
Petan	15-23	Hard	14-20	Thin	Moderate	Moderate	Low.
Deunah	22-40	Hard	20-34	Thick	Moderate	Moderate	Moderate.
Hatpeak	40-50	Hard	20-34	Thick	High	Moderate	Low.

See footnote at end of table.

TABLE 17.--SOIL FEATURES--Continued

Soil name and map symbol	Bedrock		Cemented pan		Potential frost action	Risk of corrosion	
	Depth	Hardness	Depth	Hardness		Uncoated steel	Concrete
	In		In				
27*:							
Rubble land.							
Deunah	22-40	Hard	20-34	Thick	Moderate	Moderate	Moderate.
28*:							
Rubble land.							
Rock outcrop.							
Argixerolls.							
29*:							
Searla	>60	---	---	---	Moderate	High	Low.
Povey	>60	---	---	---	Moderate	High	Low.
30--Simonton	>60	---	---	---	Moderate	Moderate	Low.
31*:							
Simonton	>60	---	---	---	Moderate	Moderate	Low.
Bluecreek	>60	---	20-40	Thick	Moderate	High	Low.
32*, 33*:							
Simonton	>60	---	---	---	Moderate	Moderate	Low.
Thacker	>60	---	20-40	Thin	Moderate	Moderate	Low.
34--Soonahbe	>60	---	42-52	Thick	Moderate	High	Low.
35*:							
Soonahbe	>60	---	42-52	Thick	Moderate	High	Low.
Thacker	>60	---	20-40	Thin	Moderate	Moderate	Low.
36*:							
Soonahbe Variant	20-40	Soft	---	---	Moderate	Moderate	Low.
Bulake	14-20	Hard	---	---	Moderate	Moderate	Low.
37*:							
Strickland	20-40	Hard	---	---	Moderate	Moderate	Moderate.
Bluebell	20-40	Soft	---	---	Moderate	Moderate	Moderate.
38, 39--Thacker	>60	---	20-40	Thin	Moderate	Moderate	Low.
40*, 41*:							
Thacker	>60	---	20-40	Thin	Moderate	Moderate	Low.
Simonton	>60	---	---	---	Moderate	Moderate	Low.
42*:							
Thacker	>60	---	20-40	Thin	Moderate	Moderate	Low.
Soonahbe	>60	---	42-52	Thick	Moderate	High	Low.
43*:							
Thacker	>60	---	20-40	Thin	Moderate	Moderate	Low.
Yatahoney	24-40	Hard	20-38	Thick	Moderate	High	Low.
44, 45--Tucker	>60	---	---	---	High	High	Low.

See footnote at end of table.

TABLE 17.--SOIL FEATURES--Continued

Soil name and map symbol	Bedrock		Cemented pan		Potential frost action	Risk of corrosion	
	Depth	Hardness	Depth	Hardness		Uncoated steel	Concrete
	In		In				
46---------- Tucker Variant	>60	---	---	---	Moderate-------	Moderate-------	Low.
47*:							
Watchabob----------	20-40	Hard	---	---	Moderate-------	Moderate-------	Moderate.
Bearskin Variant-------	10-20	Hard	---	---	Moderate-------	Moderate-------	Low.
48---------- Wickahoney	10-20	Hard	---	---	Moderate-------	Moderate-------	Low.
49*:							
Wickahoney----------	10-20	Hard	---	---	Moderate-------	Moderate-------	Low.
Blackleg----------	>60	---	20-40	Thick	Moderate-------	Moderate-------	Low.
50*:							
Wickahoney----------	10-20	Hard	---	---	Moderate-------	Moderate-------	Low.
Wagonbox----------	12-23	Hard	11-20	Thick	Moderate-------	Moderate-------	Low.
51*:							
Yatahoney----------	24-40	Hard	20-38	Thick	Moderate-------	High----------	Low.
Blackleg----------	>60	---	30-40	Thick	Moderate-------	High----------	Low.
52*:							
Yatahoney----------	24-40	Hard	20-38	Thick	Moderate-------	High----------	Low.
Soonahbe----------	>60	---	42-52	Thick	Moderate-------	High----------	Low.
53---------- Zola	>60	---	---	---	Moderate-------	High----------	Low.
54---------- Zola	>60	---	---	---	Moderate-------	High----------	Low.
55*:							
Zola----------	>60	---	---	---	Moderate-------	High----------	Low.
Hayspur----------	>60	---	---	---	High----------	High----------	Low.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 18.--CLASSIFICATION OF THE SOILS

[An asterisk in the first column indicates that the soil is a taxadjunct to the series. See text for a description of those characteristics of the soil that are outside the range of the series]

Soil name	Family or higher taxonomic class
Arbidge	Fine-loamy, mixed, mesic Xerollic Durargids
Argixerolls	Argixerolls
Bear Lake	Fine-silty, frigid Typic Calciaquolls
Bearskin Variant	Loamy, mixed, frigid Lithic Ultic Argixerolls
Bedstead	Clayey-skeletal, montmorillonitic, mesic Abruptic Xerollic Durargids
Blackfoot	Fine-loamy, mixed, frigid Fluvaquentic Haploxerolls
Blackleg	Clayey-skeletal, montmorillonitic, frigid Typic Durixerolls
Bluebell	Loamy-skeletal, mixed Argic Pachic Cryoborolls
Bluecreek	Fine, montmorillonitic, frigid Haplic Durixeralfs
Bluecreek Variant	Clayey over sandy or sandy-skeletal, montmorillonitic, frigid Typic Natrixeralfs
*Boulder Lake	Fine, montmorillonitic, frigid Aquic Chromoxererts
Bulake	Clayey, montmorillonitic, frigid Lithic Mollic Haploxeralfs
Burmah Variant	Fine, montmorillonitic, frigid Typic Palexeralfs
Cavanaugh	Clayey-skeletal, montmorillonitic, frigid Ultic Argixerolls
Crooked Creek	Fine, montmorillonitic, frigid Cumulic Haplaquolls
Deunah	Very-fine, montmorillonitic, frigid Abruptic Durixeralfs
Disabel Variant	Fine, montmorillonitic, frigid Typic Natrixeralfs
Dranyon	Fine-loamy, mixed Argic Pachic Cryoborolls
Durixeralfs	Durixeralfs
Earcree	Coarse-loamy, mixed Pachic Cryoborolls
Haploxeralfs	Haploxeralfs
Hatpeak	Fine, montmorillonitic, frigid Typic Durixerolls
Hayspur	Fine-loamy, mixed, frigid Fluvaquentic Haplaquolls
Lasauses Variant	Very-fine, montmorillonitic, nonacid frigid Aeric Halaquepts
Moonstone	Coarse-loamy, mixed, frigid Pachic Ultic Haploxerolls
Obray	Fine, montmorillonitic, frigid Typic Chromoxererts
*Parkay	Loamy-skeletal, mixed Argic Pachic Cryoborolls
Paynecreek	Fine-loamy, mixed, frigid Typic Argixerolls
Paynecreek Variant	Fine-loamy over sandy or sandy-skeletal, mixed, frigid Calcic Argixerolls
Petan	Clayey-skeletal, montmorillonitic, frigid, shallow Typic Durixerolls
Povey	Loamy-skeletal, mixed Pachic Cryoborolls
Sattley	Loamy-skeletal, mixed, frigid Ultic Argixerolls
Searla	Loamy-skeletal, mixed, frigid Calcic Argixerolls
Simonton	Fine-loamy, mixed, frigid Ultic Argixerolls
Soonahbe	Fine-loamy, mixed, frigid Mollic Haploxeralfs
Soonahbe Variant	Fine-loamy, mixed, frigid Mollic Haploxeralfs
Strickland	Fine-loamy, mixed Pachic Cryoborolls
Thacker	Fine, montmorillonitic, frigid Abruptic Durixeralfs
Torney Variant	Fine, montmorillonitic, frigid Ultic Palexerolls
Tucker	Fine, montmorillonitic, frigid Cumulic Haploxerolls
Tucker Variant	Clayey over sandy or sandy-skeletal, mixed, frigid Fluvaquentic Haploxerolls
Wagonbox	Clayey-skeletal, montmorillonitic, frigid, shallow Typic Durixeralfs
Watchabob	Fine-loamy, mixed, frigid Pachic Ultic Argixerolls
Wickahoney	Clayey-skeletal, montmorillonitic, frigid Lithic Mollic Haploxeralfs
Yatahoney	Fine, montmorillonitic, frigid Typic Durixeralfs
Zola	Fine-loamy, mixed, frigid Cumulic Haploxerolls

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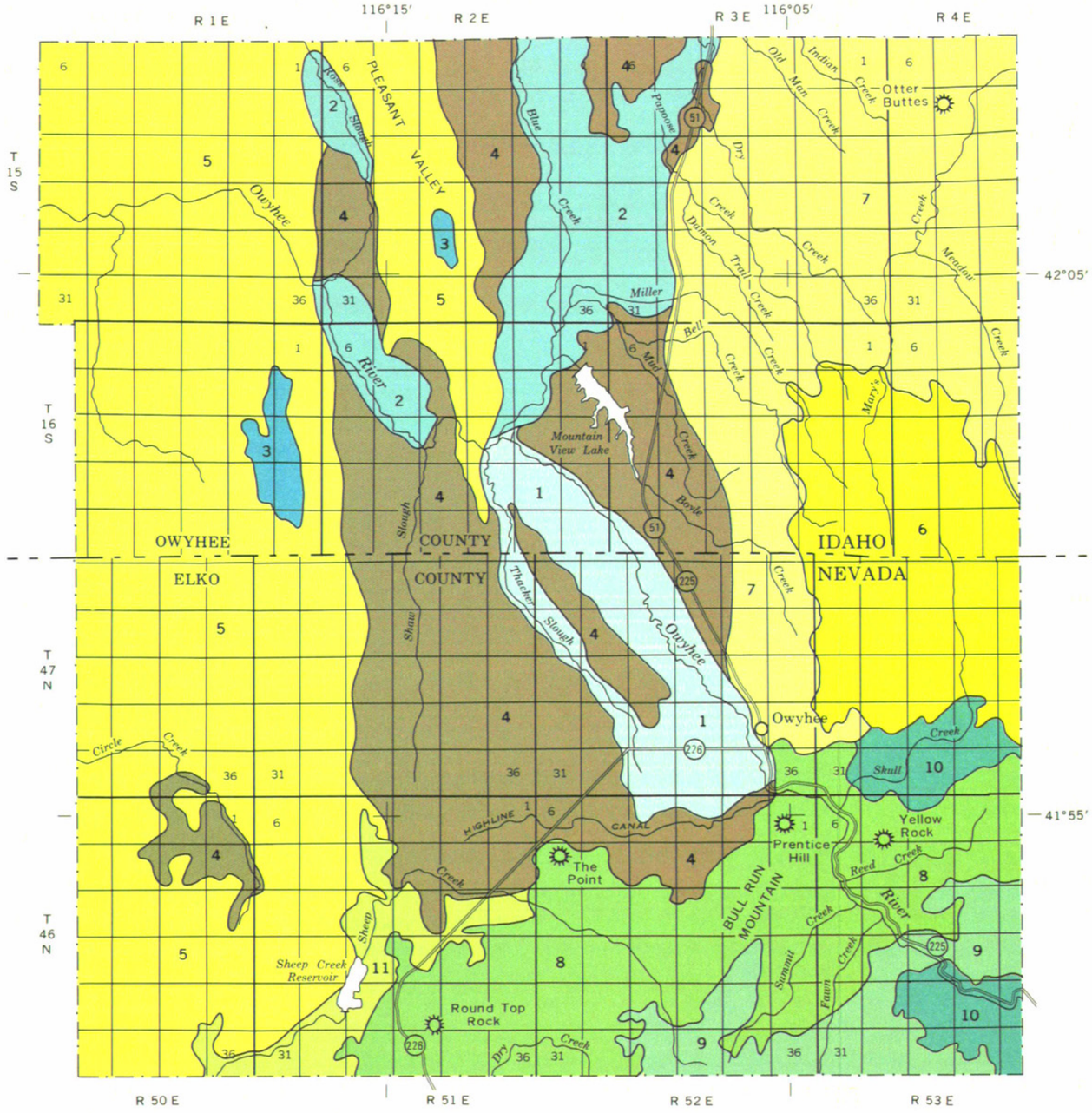


SECTIONALIZED TOWNSHIP

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

N

Each area outlined on this map consists of more than one kind of soil. The map is thus meant for general planning rather than a basis for decisions on the use of specific tracts.

LEGEND

SOILS ON FLOOD PLAINS AND LAKEBEDS

1 — Zola-Hayspur: Nearly level, moderately well drained and poorly drained, very deep soils that have a loamy subsoil; on flood plains

2 — Disabel Variant-Tucker-Crooked Creek: Nearly level, moderately well drained, somewhat poorly drained and very poorly drained, very deep soils that have a clayey subsoil; on flood plains

3 — Lasauses Variant-Boulder Lake: Nearly level, poorly drained and somewhat poorly drained, very deep soils that have a clayey subsoil; on lakebeds

SOILS ON ALLUVIAL TERRACES AND PEIDMONT SLOPES

4 — Thacker-Soonahbe-Paynecreek: Nearly level to rolling, well drained, moderately deep to very deep soils

SOILS ON BASALT AND RHYOLITE TABLELANDS AND ON PLATEAUS

5 — Deunah-Rubble land-Bulake: Nearly level to hilly, well drained, moderately deep and shallow soils that have a clayey subsoil, and Rubble land; on tablelands

6 — Strickland-Bluebell: Undulating to hilly, well drained, moderately deep soils that have a loamy subsoil; on summits of high plateaus

7 — Wickahoney-Wagonbox: Nearly level to hilly, well drained, shallow soils; on basalt tableland summits

SOILS ON HILLS AND MOUNTAINS

8 — Cavanaugh-Sattley-Obray: Gently sloping to steep, well drained, moderately deep to very deep soils; on rhyolite and rhyolitic tuff hillsides

9 — Parkay-Dranyon-Cavanaugh: Moderately steep to very steep, well drained, deep and moderately deep soils that are cool in summer; on rhyolite and rhyolitic tuff hillsides and mountainsides

10 — Moonstone-Earcree-Watchabob: Sloping to steep, well drained, moderately deep and very deep soils; on granite hillsides and mountainsides

11 — Soonahbe-Variant-Bulake: Nearly level to rolling, well drained, moderately deep and shallow soils; on rhyolitic tuff hillsides

Compiled 1984

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF INDIAN AFFAIRS

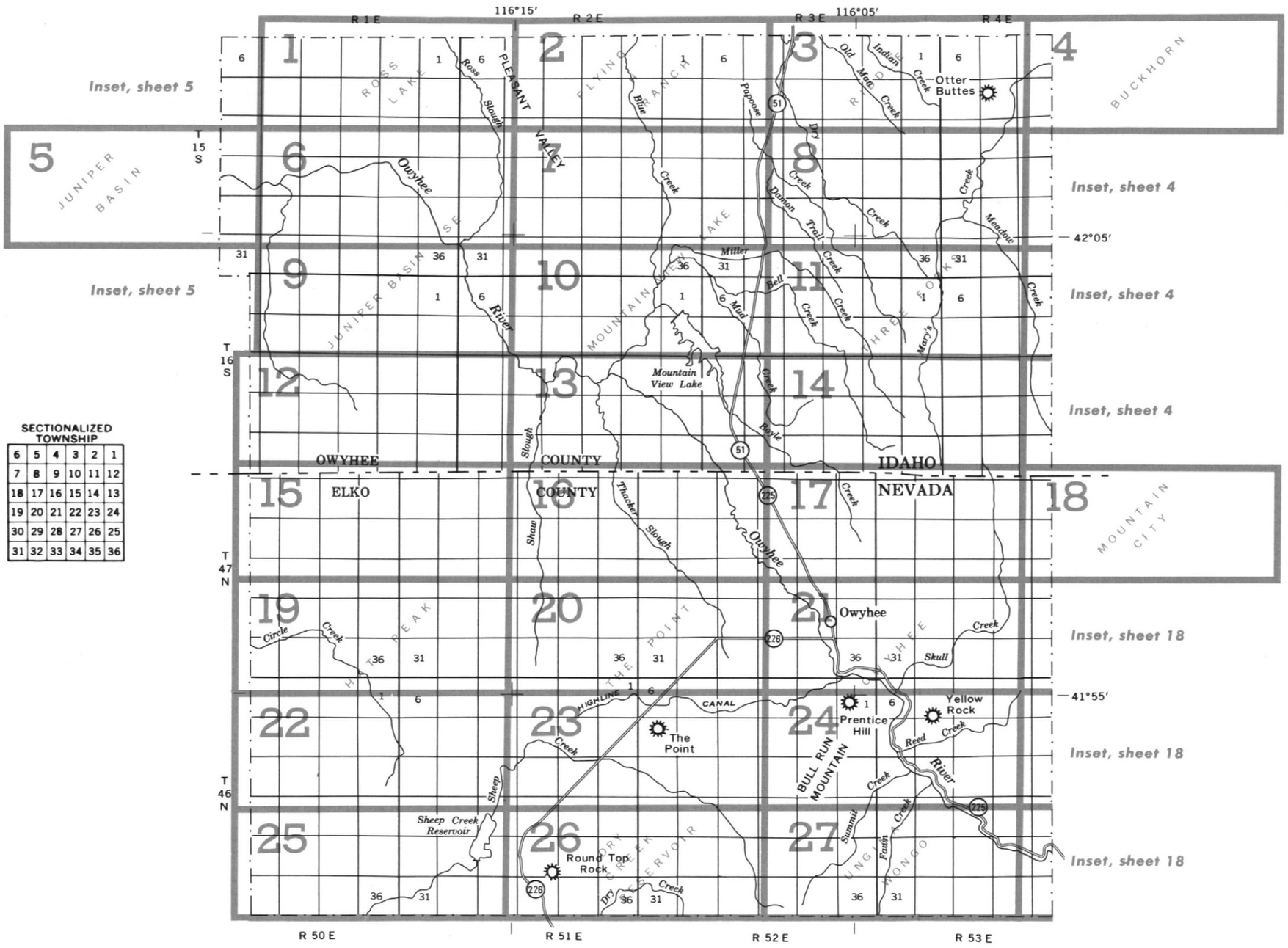
GENERAL SOIL MAP

DUCK VALLEY INDIAN RESERVATION
IDAHO-NEVADA

Scale 1:190,080

1 0 1 2 3 Miles

1 0 3 6 Km



INDEX TO MAP SHEETS

DUCK VALLEY INDIAN RESERVATION
IDAHO-NEVADA

Scale 1:190,080

1 0 1 2 3 Miles

1 0 3 6 Km

SOIL LEGEND

SYMBOL	NAME
1	Bedstead-Arbidge association, 2 to 15 percent slopes
2	Blackfoot, frequently flooded-Tucker, gravelly substratum complex, 0 to 2 percent slopes
3	Bluecreek-Thacker dry complex, 1 to 4 percent slopes
4	Bluecreek Variant-Paynecreek Variant complex, 0 to 4 percent slopes
5	Boulder Lake-Tucker, gravelly substratum complex, 0 to 1 percent slopes
6	Bulake-Deunah complex, 2 to 25 percent slopes
7	Burmah Variant-Torney Variant-Yatahoney complex, 0 to 2 percent slopes
8	Cavanaugh-Obray association, 4 to 30 percent slopes
9	Cavanaugh-Sattley association, 15 to 40 percent slopes
10	Crooked Creek-Bear Lake complex, 0 to 2 percent slopes
11	Deunah stony silt loam, 1 to 4 percent slopes
12	Disabel Variant silt loam, 0 to 2 percent slopes
13	Disabel Variant-Bluecreek complex, 0 to 3 percent slopes
14	Dranyon-Strickland-Parkay association, 2 to 30 percent slopes
15	Haploxeralfs-Durixeralfs-Rubble land complex, 20 to 50 percent slopes
16	Hayspur clay loam, 0 to 2 percent slopes
17	Hayspur-Blackfoot complex, 0 to 2 percent slopes
18	Hayspur-Zola, frequently flooded-Paynecreek complex, 0 to 4 percent slopes
19	Lasauses Variant-Boulder Lake association, 0 to 1 percent slopes
20	Moonstone-Earcree association, 20 to 45 percent slopes
21	Parkay-Dranyon-Cavanaugh complex, 15 to 50 percent slopes
22	Parkay-Wickahoney-Boulder Lake complex, 0 to 30 percent slopes
23	Paynecreek gravelly loam, 1 to 4 percent slopes
24	Paynecreek gravelly loam, 8 to 16 percent slopes
25	Paynecreek-Thacker dry complex, 4 to 10 percent slopes
26	Petan-Deunah-Hatpeak complex, 1 to 8 percent slopes
27	Rubble land-Deunah complex, 1 to 6 percent slopes
28	Rubble land-Rock outcrop-Argixerolls complex, 25 to 95 percent slopes
29	Searla-Povey association, 30 to 60 percent slopes
30	Simonton sandy loam, 1 to 3 percent slopes
31	Simonton-Bluecreek complex, 1 to 4 percent slopes
32	Simonton-Thacker dry complex, 1 to 4 percent slopes
33	Simonton-Thacker dry complex, 4 to 10 percent slopes
34	Soonahbe silt loam, 1 to 3 percent slopes
35	Soonahbe-Thacker dry complex, 1 to 4 percent slopes
36	Soonahbe Variant-Bulake complex, 2 to 15 percent slopes
37	Strickland-Bluebell complex, 2 to 20 percent slopes
38	Thacker loam, 1 to 4 percent slopes
39	Thacker very stony loam, 2 to 10 percent slopes
40	Thacker-Simonton complex, 1 to 4 percent slopes
41	Thacker-Simonton complex, 4 to 10 percent slopes
42	Thacker-Soonahbe complex, 4 to 10 percent slopes
43	Thacker-Yatahoney complex, 1 to 8 percent slopes
44	Tucker silty clay loam, 0 to 2 percent slopes
45	Tucker silty clay loam, gravelly substratum, 0 to 2 percent slopes
46	Tucker Variant silty clay loam, 0 to 2 percent slopes
47	Watchabob-Bearskin Variant complex, 10 to 40 percent slopes
48	Wickahoney stony loam, 2 to 20 percent slopes
49	Wickahoney-Blackleg association, 2 to 30 percent slopes
50	Wickahoney-Wagonbox complex, 2 to 8 percent slopes
51	Yatahoney-Blackleg complex, 4 to 20 percent slopes
52	Yatahoney-Soonahbe complex, 2 to 10 percent slopes
53	Zola loam, 0 to 2 percent slopes
54	Zola loam, frequently flooded, 0 to 2 percent slopes
55	Zola-Hayspur complex, channeled
	Water

CONVENTIONAL AND SPECIAL SYMBOLS LEGEND

CULTURAL FEATURES

BOUNDARIES

- National, state or province
- County or parish
- Minor civil division
- Reservation (national forest or park, state forest or park, and large airport)
- Land grant
- Limit of soil survey (label)
- Field sheet matchline & neatline
- AD HOC BOUNDARY (label) — Hedley Airstrip
- Small airport, airfield, park, oilfield, cemetery, or flood pool — FLOOD POOL LINE
- STATE COORDINATE TICK
- LAND DIVISION CORNERS (sections and land grants)

ROADS

- Divided (median shown if scale permits)
- Other roads
- Trail

ROAD EMBLEM & DESIGNATIONS

- Interstate — 21
- Federal — 173
- State — 28
- County, farm or ranch — 1283

- RAILROAD
- POWER TRANSMISSION LINE (normally not shown)
- PIPE LINE (normally not shown)
- FENCE (normally not shown)

LEVEES

- Without road
- With road
- With railroad

DAMS

- Large (to scale)
- Medium or small — water — w

PITS

- Gravel pit
- Mine or quarry

MISCELLANEOUS CULTURAL FEATURES

- Farmstead, house (omit in urban areas)
- Church
- School
- Indian mound (label) — Indian Mound
- Located object (label) — Tower
- Tank (label) — Gas
- Wells, oil or gas
- Windmill
- Kitchen midden

WATER FEATURES

DRAINAGE

- Perennial, double line
- Perennial, single line
- Intermittent
- Drainage end
- Canals or ditches
  - Double-line (label) — CANAL
  - Drainage and/or irrigation

LAKES, PONDS AND RESERVOIRS

- Perennial — water — w
- Intermittent — int — i

MISCELLANEOUS WATER FEATURES

- Marsh or swamp
- Spring
- Well, artesian
- Well, irrigation
- Wet spot

SPECIAL SYMBOLS FOR SOIL SURVEY

- SOIL DELINEATIONS AND SYMBOLS — 2 — 15
- ESCARPMENTS
  - Bedrock (points down slope)
  - Other than bedrock (points down slope)
- SHORT STEEP SLOPE
- GULLY
- DEPRESSION OR SINK
- SOIL SAMPLE SITE (normally not shown) — S
- MISCELLANEOUS
  - Blowout
  - Clay spot
  - Gravelly spot
  - Gumbo, slick or scabby spot (sodic)
  - Dumps and other similar non soil areas
  - Prominent hill or peak
  - Rock outcrop (includes sandstone and shale)
  - Saline spot
  - Sandy spot
  - Severely eroded spot
  - Slide or slip (tips point upslope)
  - Stony spot, very stony spot — 0

DUCK VALLEY INDIAN RESERVATION, IDAHO AND NEVADA — SHEET NUMBER 1

N

116°22'30"
42°10'00"

R. 1 E. | R. 2 E.

360 000 FEET

T. 15 S. | T. 14 S.

180 000 FEET

170 000 FEET

335 000 FEET

DUCK VALLEY INDIAN RESERVATION BOUNDARY

ROSS

LAKE

ROUGH

LAKE

ROSS

PLEASANT

VALLEY

Willies Reservoir

Willies Reservoir

int

int

903

(Joins inset B, sheet 5)

(Joins sheet 2)

(Joins sheet 6)

42°07'30"
116°15'00"

1 3/4 1/2 1/4 0 1 2 MILES

1 0.5 0 1 2 KILOMETERS

SCALE 1:24 000

N

DUCK VALLEY INDIAN RESERVATION, IDAHO AND NEVADA — SHEET NUMBER 2

365 000 FEET

R. 2 E. | R. 3 E.

116°07'30"

42°10'00"

180 000 FEET

T. 15 S. | T. 14 S.

(Joins sheet 1)

LAKE

ROUGH

DUCK VALLEY INDIAN RESERVATION BOUNDARY

902

Creek

Blue

DUCK VALLEY

(Joins sheet 3)

170 000 FEET

42°07'30"

116°15'00"

(Joins sheet 7)

395 000 FEET

1 3/4 1/2 1/4 0 1 2 MILES

1 0.5 0 1 2 KILOMETERS

SCALE 1:24 000

DUCK VALLEY INDIAN RESERVATION, IDAHO AND NEVADA — SHEET NUMBER 3

3

N

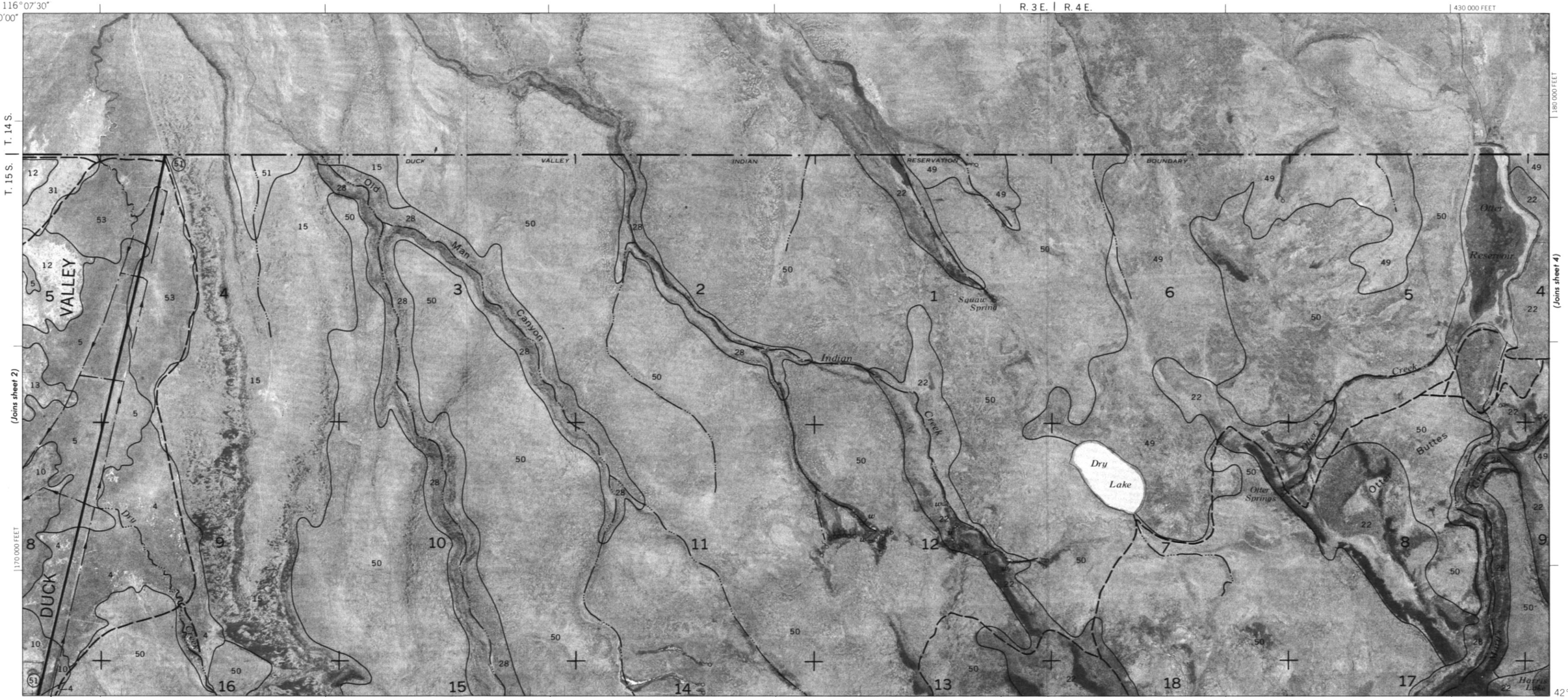
116°07'30"
42°10'00"

R. 3 E. | R. 4 E.

430 000 FEET

T. 14 S.
T. 15 S.

180 000 FEET



(Joins sheet 4)

(Joins sheet 2)

170 000 FEET

400 000 FEET

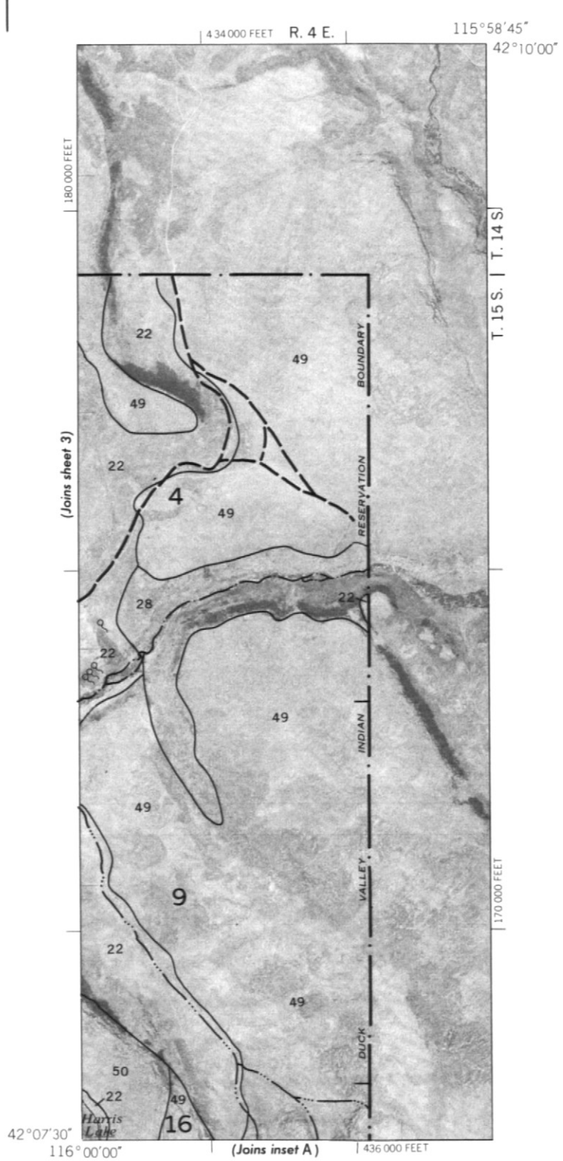
(Joins sheet 8)

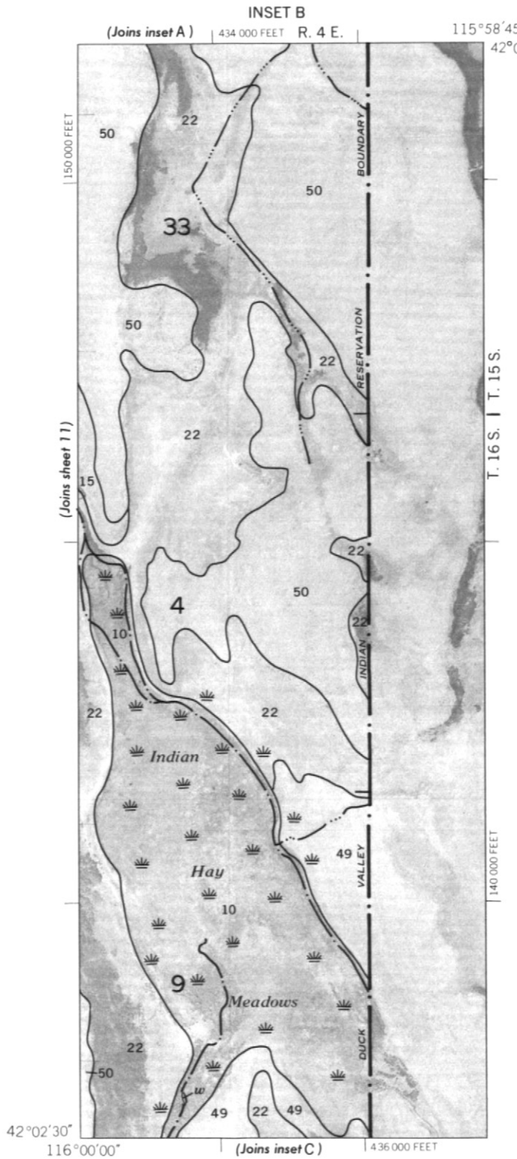
42°07'30"
116°00'00"

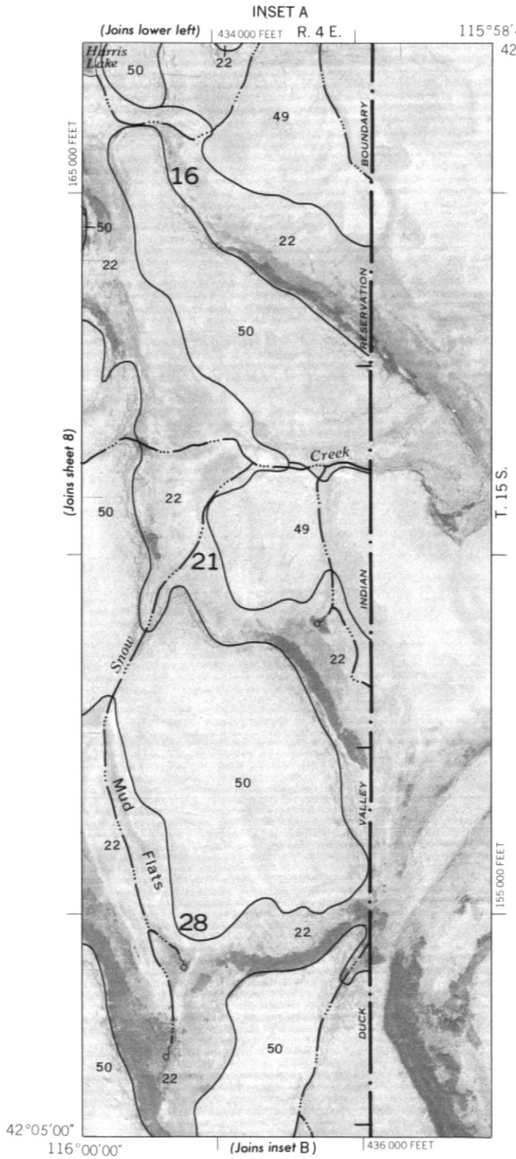
1 3/4 1/2 1/4 0 1 2 MILES

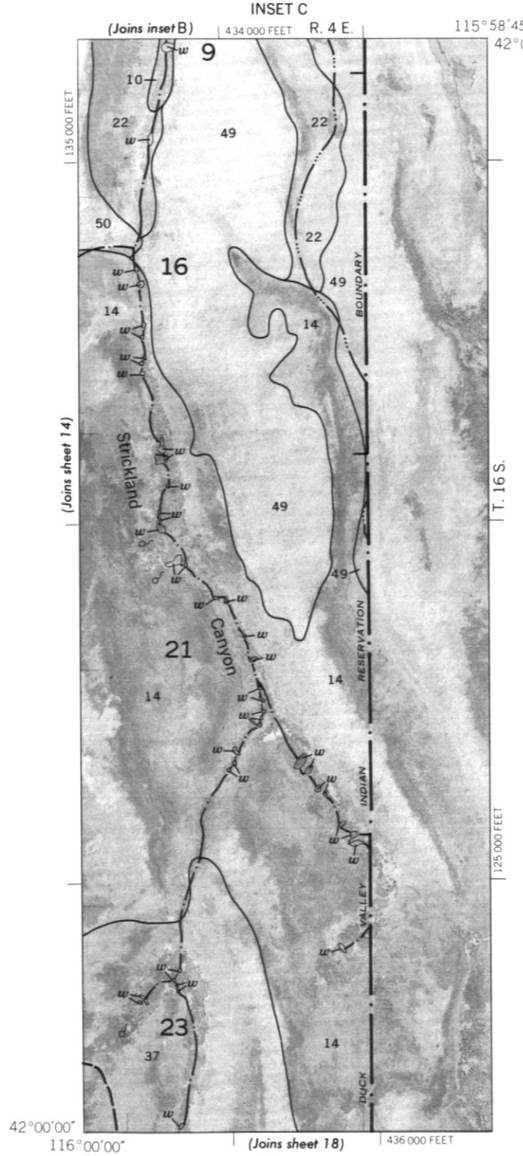
1 0.5 0 1 2 KILOMETERS

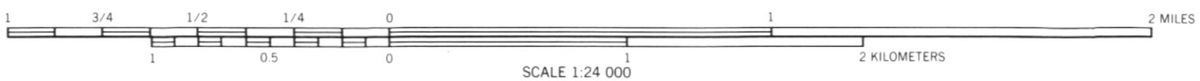
SCALE 1:24 000







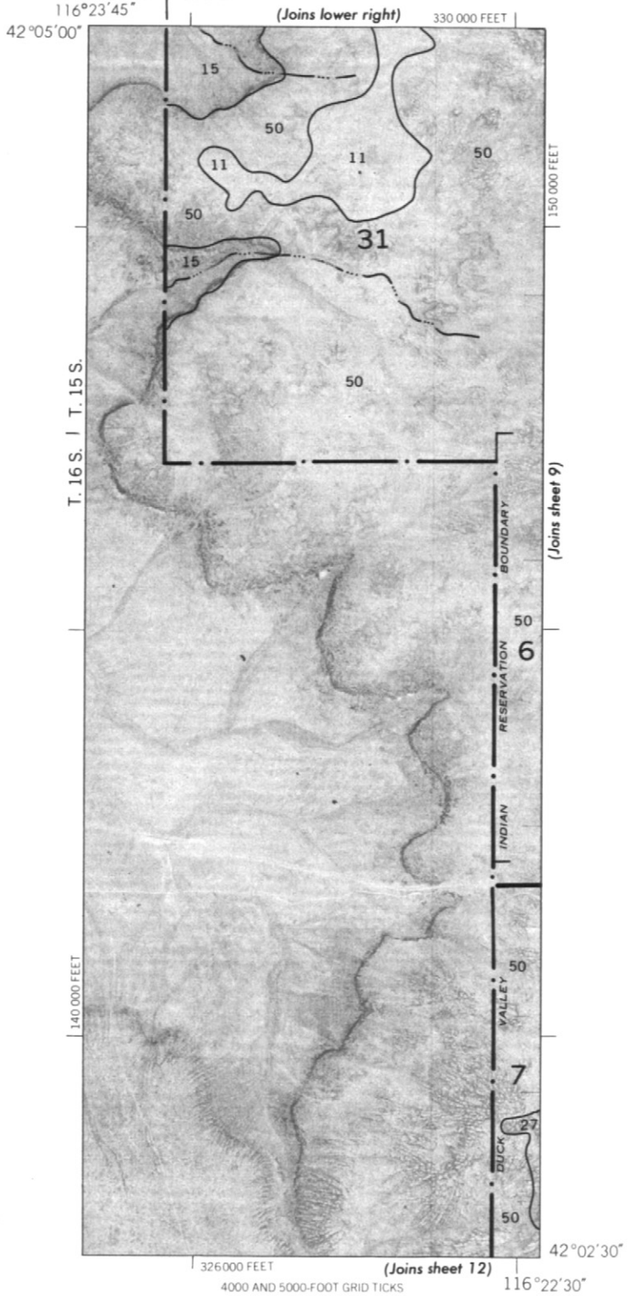




SCALE 1:24 000

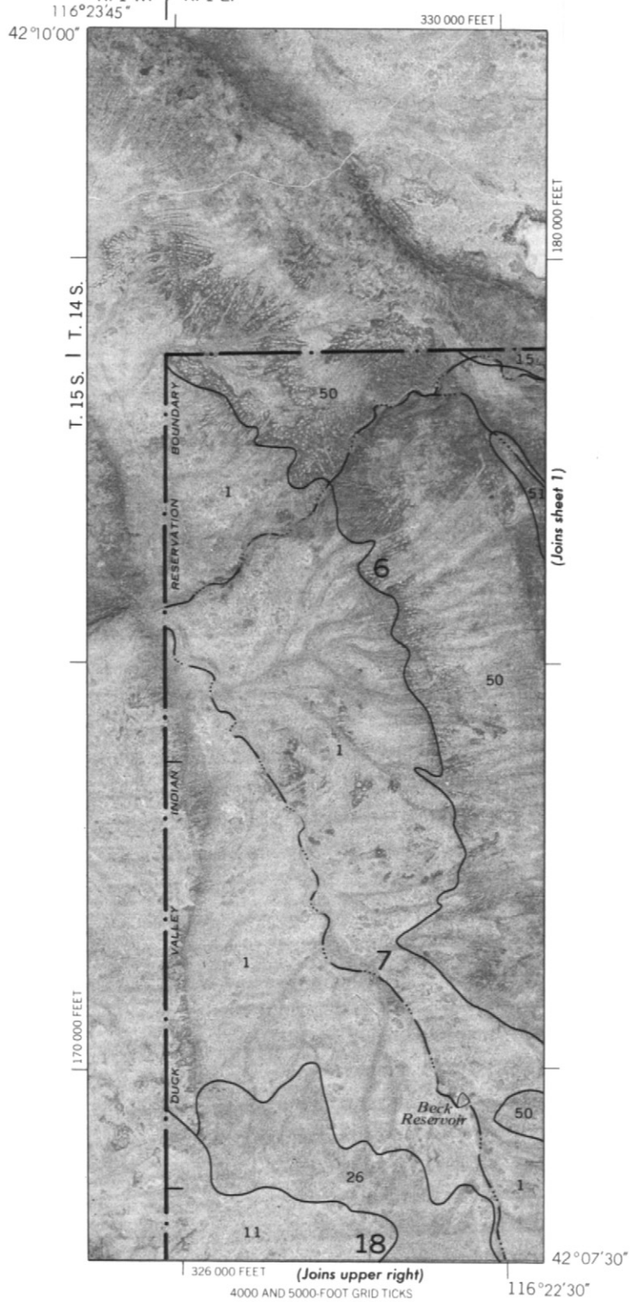
N

INSET A

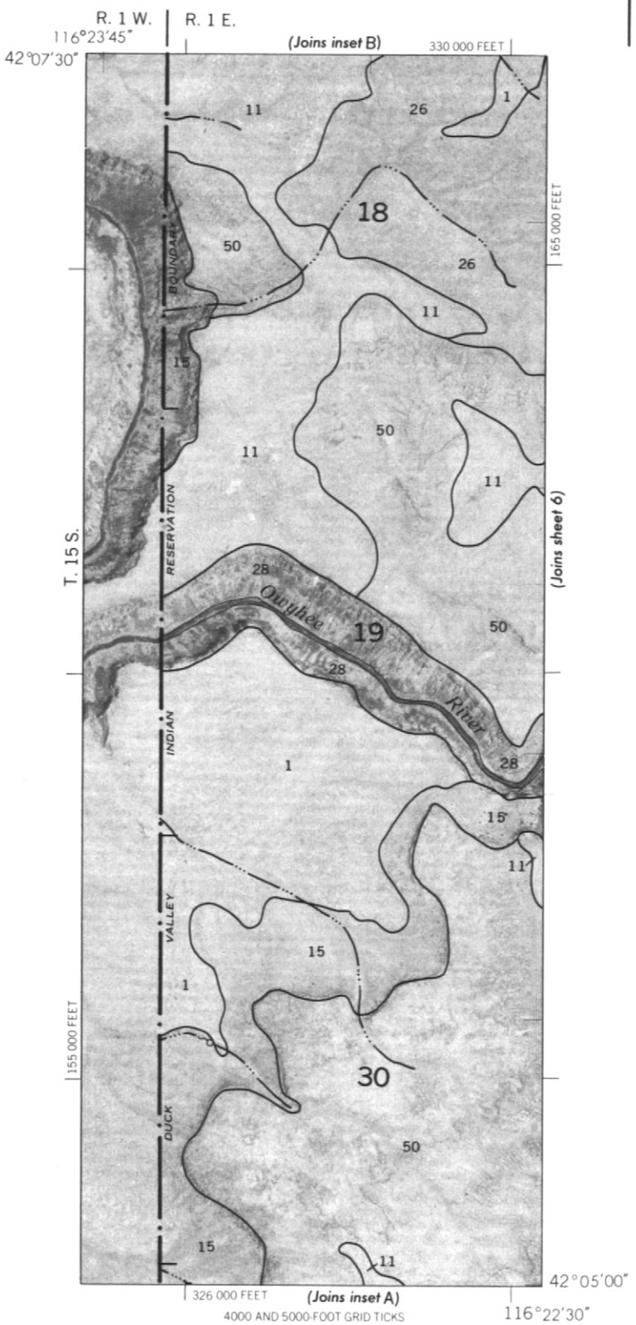


4000 AND 5000-FOOT GRID TICKS

INSET B



4000 AND 5000-FOOT GRID TICKS



4000 AND 5000-FOOT GRID TICKS

1 3/4 1/2 1/4 0 1 2 MILES

1 0.5 0 1 2 KILOMETERS

SCALE 1:24 000

N

DUCK VALLEY INDIAN RESERVATION, IDAHO AND NEVADA — SHEET NUMBER 6

335 000 FEET

(Joins sheet 1)

R. 1 E. | R. 2 E.

116°15'00"

42°07'30"

165 000 FEET

(Joins sheet 5)

T. 15 S.

(Joins sheet 7)

155 000 FEET

42°05'00"

116°22'30"

(Joins sheet 9)

360 000 FEET

Owyhee River

Barrel Spring

Jackson Reservoir

VALLEY

PLEASANT

Ross Slough

903

1 3/4 1/2 1/4 0 1 2 MILES

1 0.5 0 1 2 KILOMETERS

SCALE 1:24 000

DUCK VALLEY INDIAN RESERVATION, IDAHO AND NEVADA — SHEET NUMBER 7

7

N

116°15'00"

42°07'30"

R. 2 E. | R. 3 E.

(Joins sheet 2)

395 000 FEET

T. 15 S.

(Joins sheet 6)

155 000 FEET

165 000 FEET

(Joins sheet 8)

365 000 FEET

(Joins sheet 10)

42°05'00"

116°07'30"

Little Jarvis Lake

Blue Creek

DUCK VALLEY

Pronghorn

DONABAHBA

YOGHEE

water

SCALE 1:24 000

N

51 400 000 FEET (Joins sheet 3) R. 3 E. | R. 4 E. 116°00'00" 42°07'30"

165 000 FEET

(Joins sheet 7)

17 16 15 14 13 18 17 16

20 21 22 23 24 19 20 21

29 28 27 26 25 30 29 28

T. 15 S.

Dry Creek

Papoose Creek

Creek

Dry Creek

Damon Creek

Harris Creek

Mud Flats

Three Forks Summit Springs

Three Forks Meadow

Three Forks

(Joins inset A, sheet 4)

155 000 FEET

42°05'00" 116°07'30" (Joins sheet 11) 430 000 FEET

1 3/4 1/2 1/4 0 1 2 MILES

1 0.5 0 1 2 KILOMETERS

SCALE 1:24 000

9

N

116° 22'30"
42° 05'00"

R. 1 E. | R. 2 E. *(Joins sheet 6)*

360 000 FEET

T. 16 S. | T. 15 S.

(Joins inset A, sheet 5)

(Joins sheet 10)

Bert Mondini Reservoir

Mud Reservoir

Antelope Spring

Upper Antelope Reservoir

Shoshone

Ruby

904

340 000 FEET

335 000 FEET

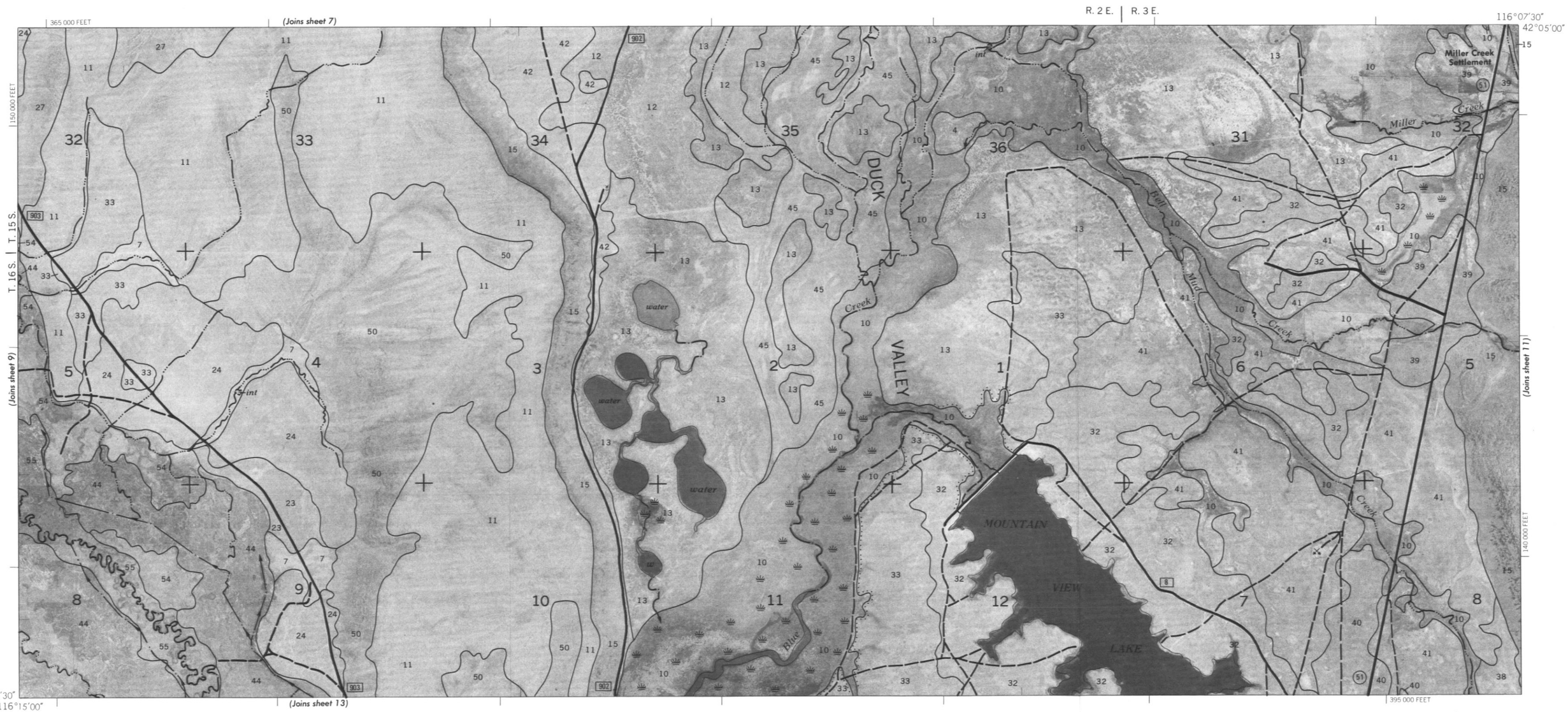
(Joins sheet 12)

42° 02'30"
116° 15'00"

SCALE 1:24 000

1 3/4 1/2 1/4 0 1 2 MILES

1 0.5 0 1 2 KILOMETERS



1 3/4 1/2 1/4 0 1 2 MILES

1 0.5 0 1 2 KILOMETERS

SCALE 1:24 000

DUCK VALLEY INDIAN RESERVATION, IDAHO AND NEVADA — SHEET NUMBER 11

11

N

116°07'30"
42°05'00"

R. 3 E. | R. 4 E.

(Joins sheet 8)

430 000 FEET

150 000 FEET

T. 16 S. | T. 15 S.

(Joins sheet 10)

(Joins inset B, sheet 4)

140 000 FEET

400 000 FEET

(Joins sheet 14)

42°02'30"
116°00'00"

Papoose Creek
Miller Creek
Bell Creek
Meadow Creek
Wahahabob Springs
Damon Springs
int

SCALE 1:24 000

1 3/4 1/2 1/4 0 1 2 MILES

1 0.5 0 1 2 KILOMETERS

335 000 FEET

(Joins sheet 9)

R. 1 E. | R. 2 E.

116°15'00"

42°02'30"

135 000 FEET

Upper Antelope Reservoir

Lower Antelope Reservoir

Cleveland Reservoir

RESERVATION BOUNDARY

DUCK VALLEY INDIAN

DUCK VALLEY

T. 16 S.

intermittent

int

(Joins sheet 13)

125 000 FEET

42°00'00"

116°22'45"

State Line Reservoir

(Joins sheet 15)

360 000 FEET

SCALE 1:24 000

1 3/4 1/2 1/4 0 1 2 MILES

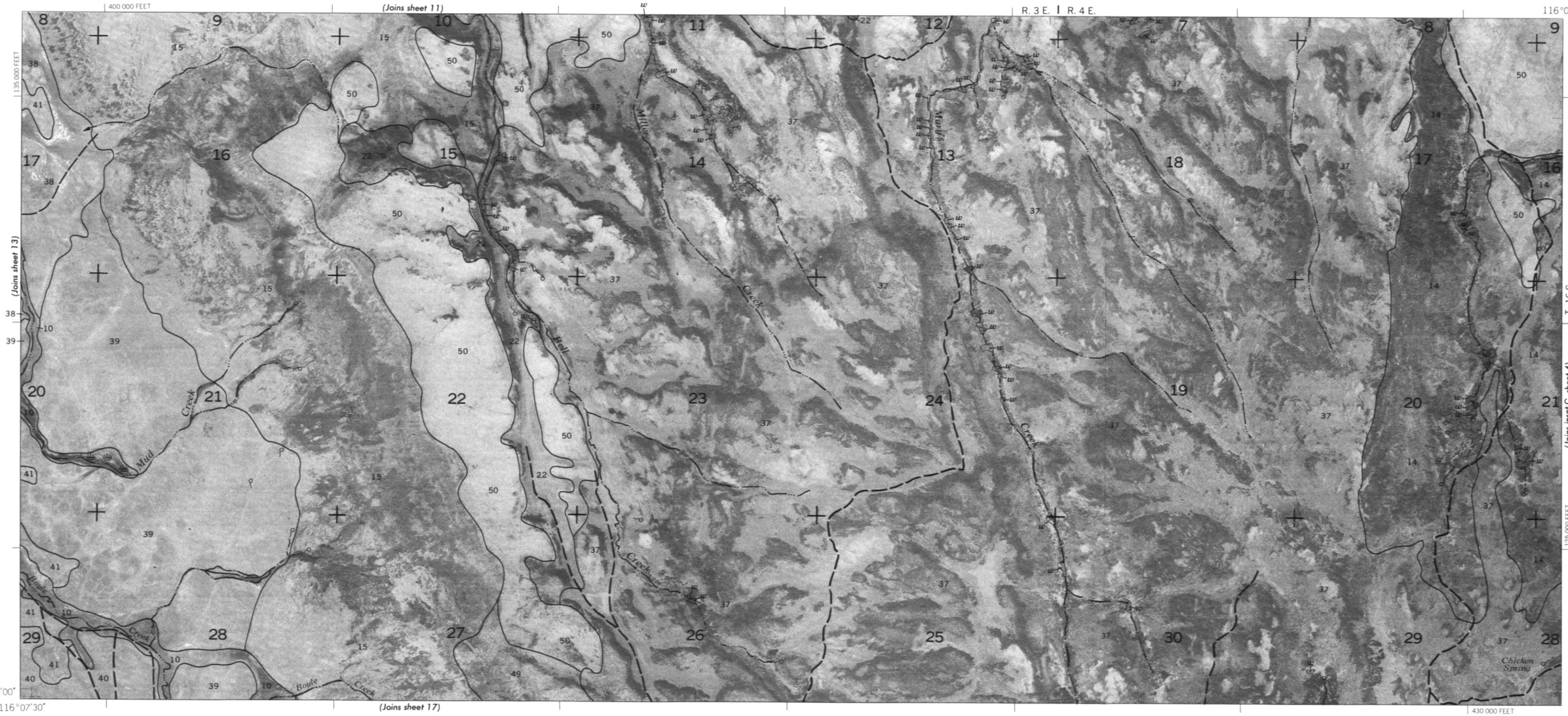
1 0.5 0 1 2 KILOMETERS

N

1 3/4 1/2 1/4 0 1 2 MILES

1 0.5 0 1 2 KILOMETERS

SCALE 1:24 000



1 3/4 1/2 1/4 0 1 2 MILES

1 0.5 0 1 2 KILOMETERS

SCALE 1:24 000

DUCK VALLEY INDIAN RESERVATION, IDAHO AND NEVADA — SHEET NUMBER 15

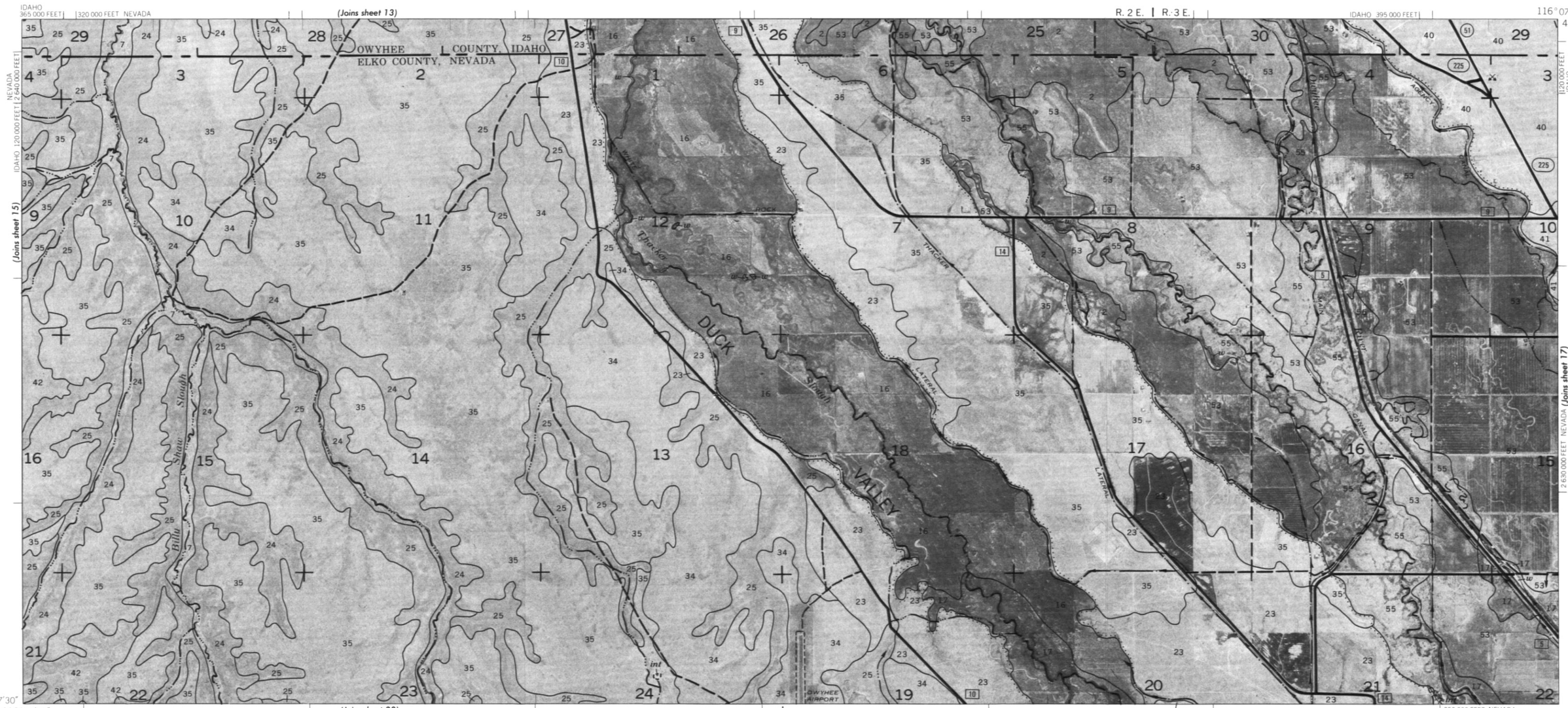
15

N

1 3/4 1/2 1/4 0 1 2 MILES

1 0.5 0 1 2 KILOMETERS

SCALE 1:24 000



1 3/4 1/2 1/4 0 1 2 MILES

1 0.5 0 1 2 KILOMETERS

SCALE 1:24 000

N

116°7'30" IDAHO 400 000 FEET | R. 3 E. | R. 4 E. | (Joins sheet 14) | IDAHO 430 000 FEET | 385 000 FEET NEVADA

42°00'00"

T. 16 S.

T. 47 N.

IDAHO 120 000 FEET

2 630 000 FEET NEVADA

(Joins sheet 16)

IDAHO 120 000 FEET | 2 640 000 FEET NEVADA

(Joins sheet 18)

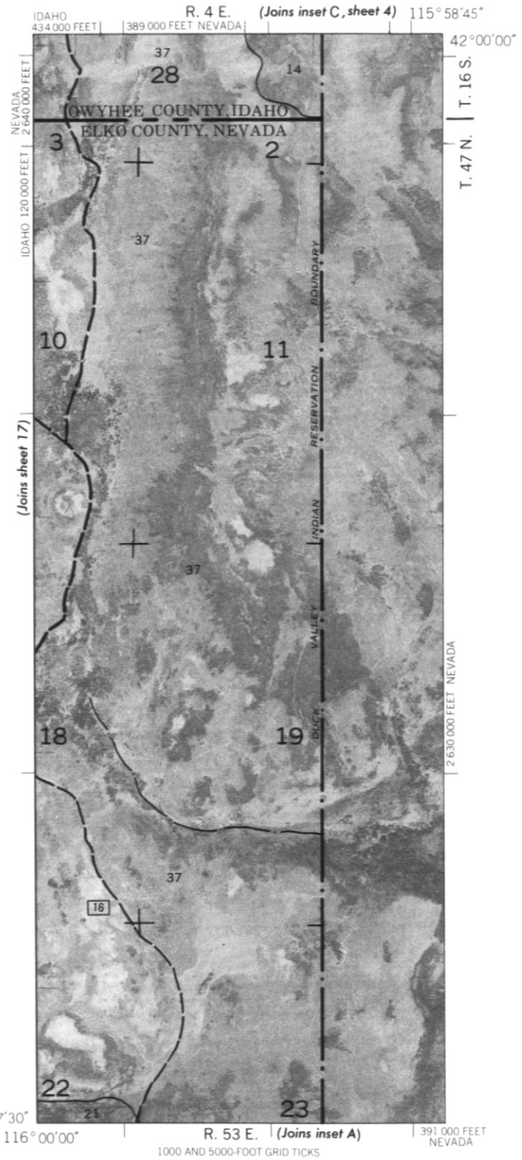
OWYHEE COUNTY, IDAHO
ELKO COUNTY, NEVADA

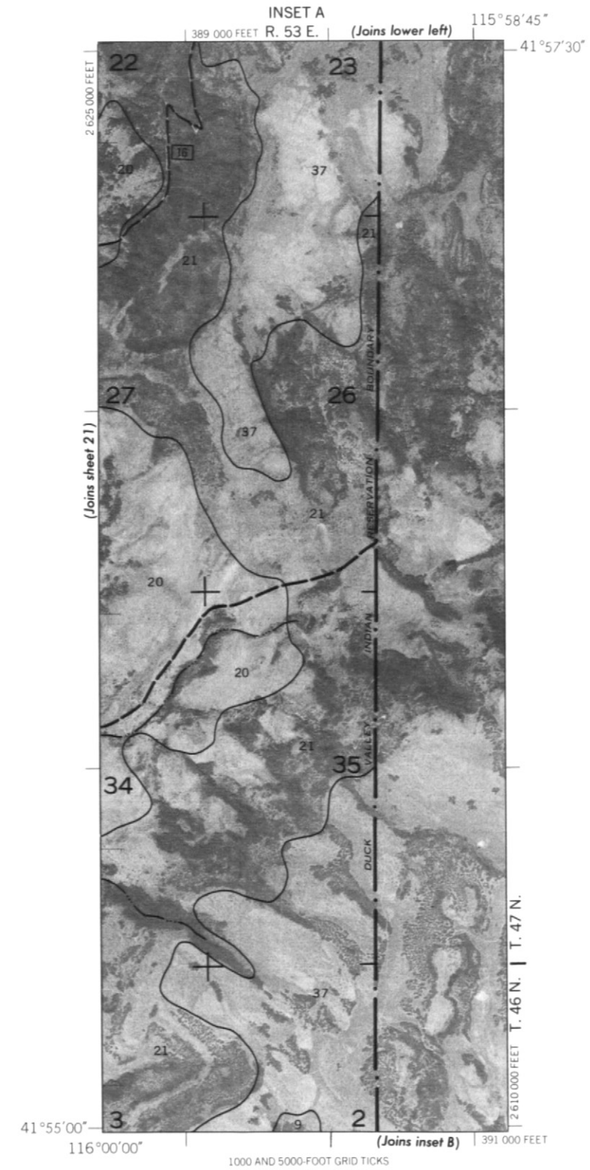
Boyle Creek
Boyle Creek
South Fork Owyhee River
Owyhee River
Bahmbasa Pond
Bahmbasa Point
Timber Point
Meadows
Willis Creek
Skull Creek
North Fork Skull Creek

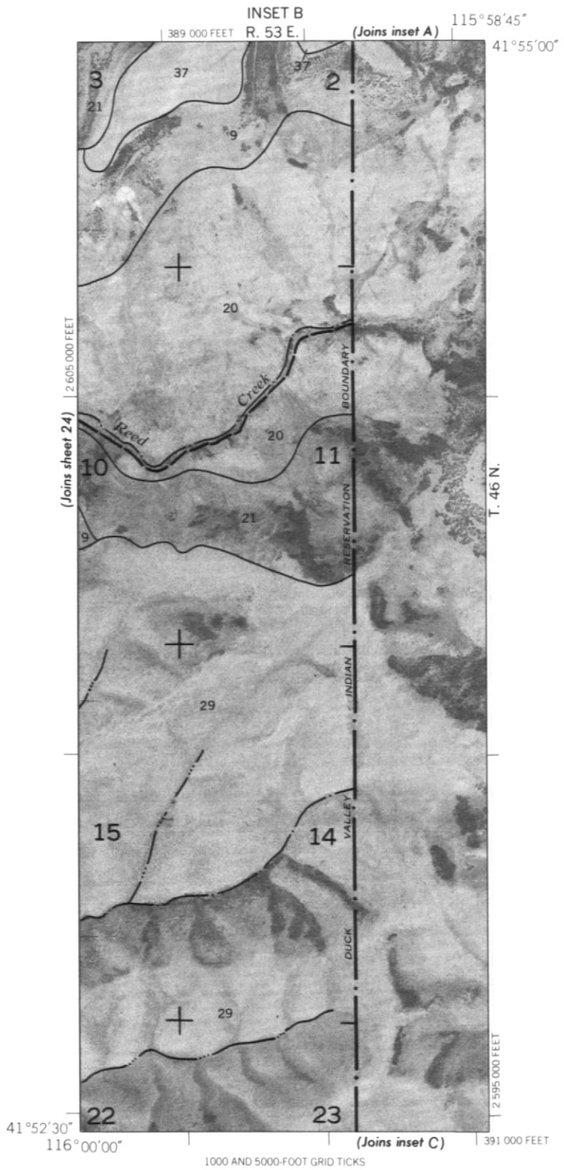
225 | 161 | 213 | 212 | 18 | 5

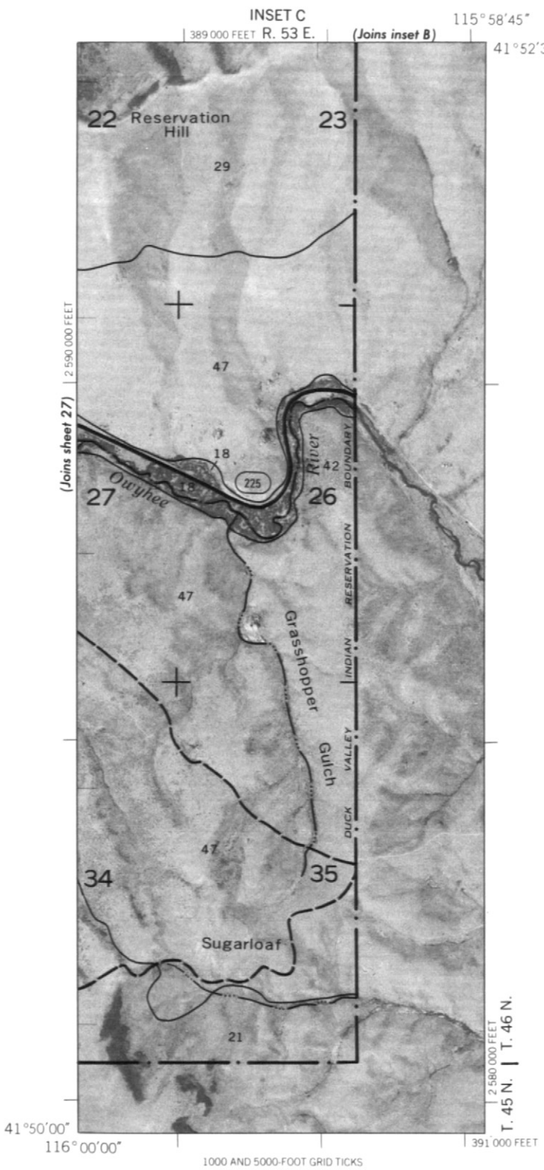
355 000 FEET NEVADA | R. 52 E. | R. 53 E. | (Joins sheet 21) | 41°57'30" 116°00'00"

1 3/4 1/2 1/4 0 1 2 MILES
1 0.5 0 1 2 KILOMETERS
SCALE 1:24 000









1 3/4 1/2 1/4 0 1 2 MILES

1 0.5 0 1 2 KILOMETERS

SCALE 1:24 000

DUCK VALLEY INDIAN RESERVATION, IDAHO AND NEVADA — SHEET NUMBER 19

19

N

1 3/4 1/2 1/4 0 1 2 MILES

1 0.5 0 1 2 KILOMETERS

SCALE 1:24 000

N

320 000 FEET

(Joins sheet 16)

R. 51 E. | R. 52 E.

16 23

116°07'30"

41°57'30"

2 625 000 FEET

(Joins sheet 19)

(Joins sheet 21)

2 615 000 FEET

T. 47 N.

T. 46 N.

53

Billy Slough

Shank Slough

int

OWYHEE AIRPORT

Thacker

MAIN CANAL

Slough

Coyote Hole

41°55'00"

116°15'00"

(Joins sheet 23)

350 000 FEET

1 3/4 1/2 1/4 0 1 2 MILES

1 0.5 0 1 2 KILOMETERS

SCALE 1:24 000

21

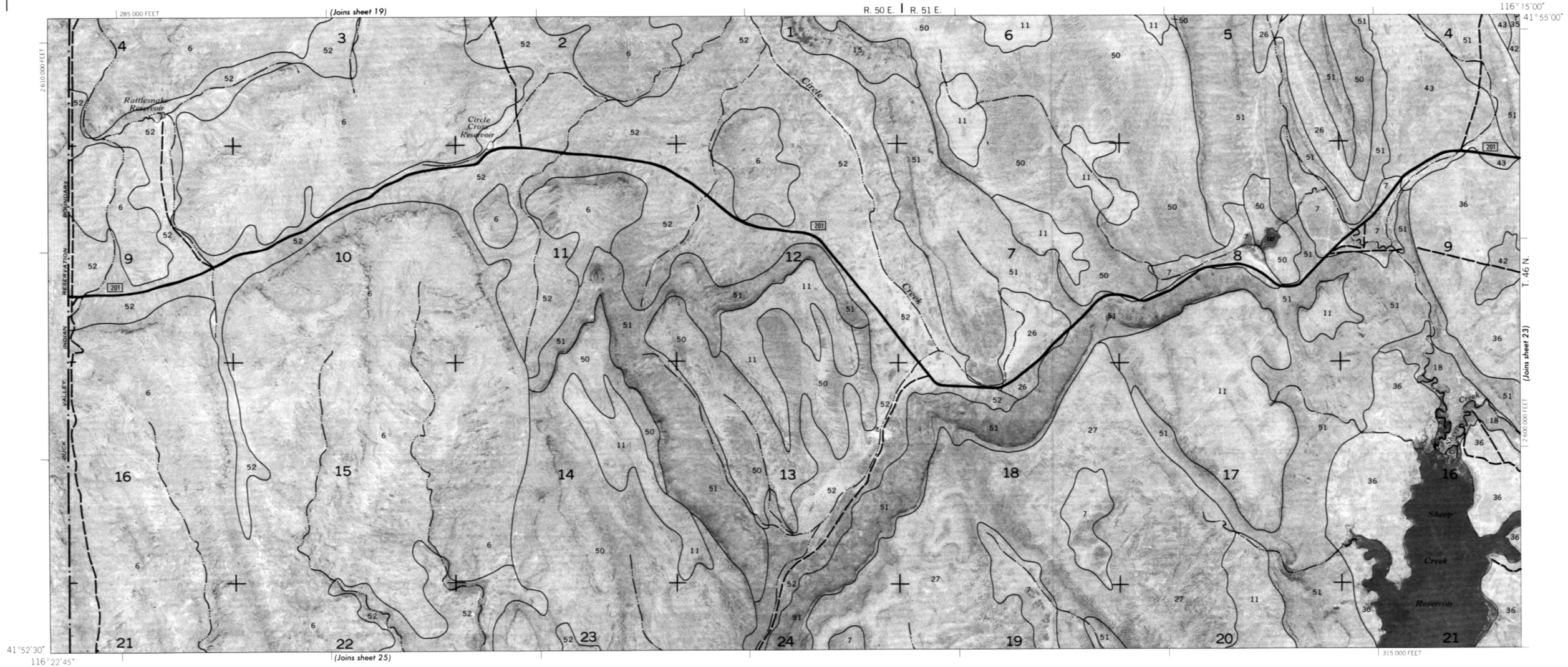
N

116°07'30"
41°57'30"
(Joins sheet 17)
R.52 E. | R.53 E.
385 000 FEET
2 625 000 FEET
(Joins inset A, sheet 18)
(Joins sheet 20)
2 615 000 FEET
T. 47 N.
T. 46 N.
355 000 FEET
(Joins sheet 24)
41°55'00"
116°00'00"

Owyhee
SEWAGE DISPOSAL PONDS
Owyhee River
The Crater
Paradise Point
CHINA DAM
Owyhee River
Ottawanah
North Fork Skull Creek
Skull Creek East Fork
MAIN CANAL
HIGHLINE CANAL
int
AGENCY
TRIBES

1 3/4 1/2 1/4 0 1 2 MILES
1 0.5 0 1 2 KILOMETERS
SCALE 1:24 000

DUCK VALLEY INDIAN RESERVATION, IDAHO AND NEVADA — SHEET NUMBER 22



1 3/4 1/2 1/4 0 1 2 MILES

1 0.5 0 1 2 KILOMETERS

SCALE 1:24 000

N

116°15'00"
41°55'00"

R. 51 E. | R. 52 E.

350 000 FEET

2 610 000 FEET

T. 46 N.

2 600 000 FEET

320 000 FEET

41°52'30"
116°07'30"

(Joins sheet 20)

(Joins sheet 22)

(Joins sheet 24)

(Joins sheet 26)

HIGHLINE CANAL

The Point

Sheep Creek

Sheep Creek Reservoir

Thacker Spring

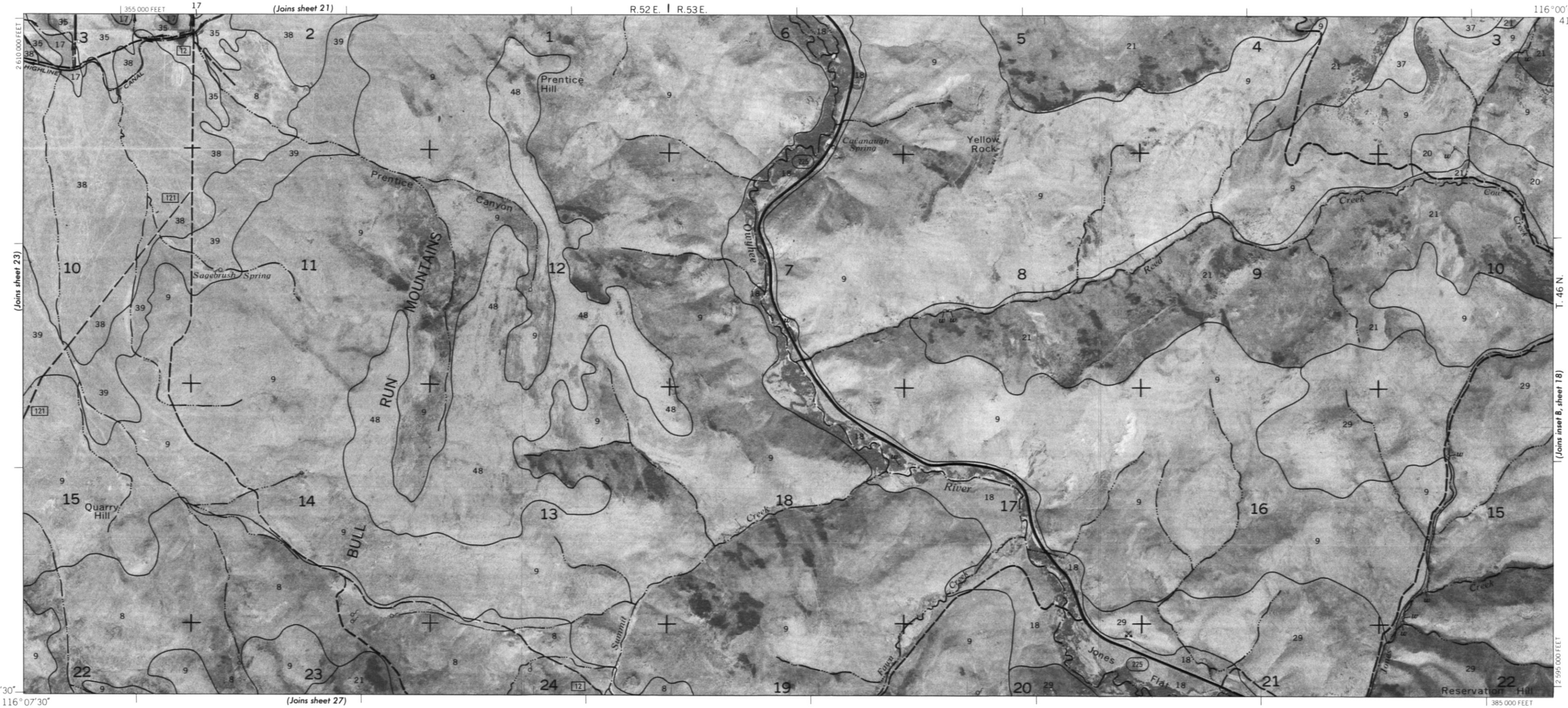
BULL RUN MOUNTAINS

201

SCALE 1:24 000

1 3/4 1/2 1/4 0 1 2 MILES

1 0.5 0 1 2 KILOMETERS



1 3/4 1/2 1/4 0 1 2 MILES

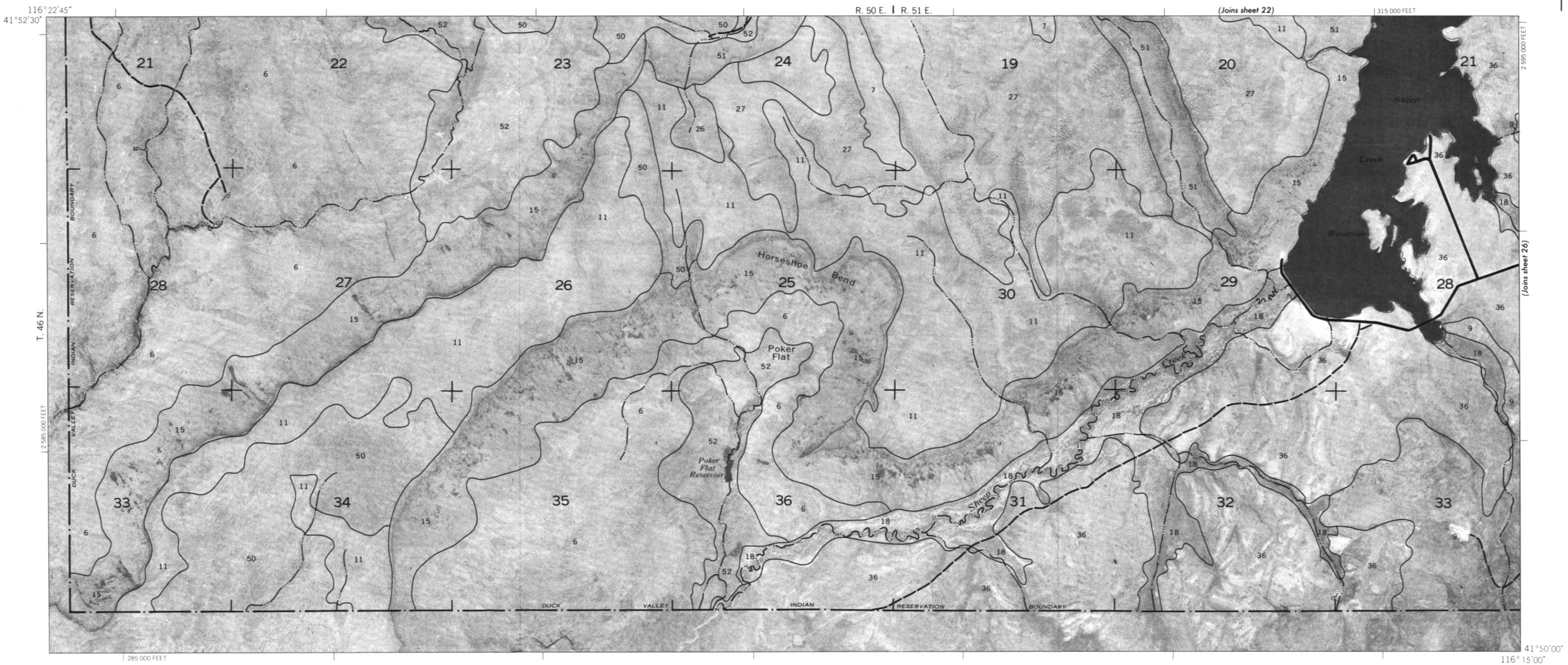
1 0.5 0 1 2 KILOMETERS

SCALE 1:24 000

DUCK VALLEY INDIAN RESERVATION, IDAHO AND NEVADA — SHEET NUMBER 25

25

N



1 3/4 1/2 1/4 0 1 2 MILES

1 0.5 0 1 2 KILOMETERS

SCALE 1:24 000

N

DUCK VALLEY INDIAN RESERVATION, IDAHO AND NEVADA — SHEET NUMBER 26

R. 51 E. | R. 52 E.

320 000 FEET

116°07'30"

41°52'30"

2 595 000 FEET

(Joins sheet 23)

(Joins sheet 25)

(Joins sheet 27)

Granger Spring

Paisewa Goei

Barrel Spring

Sheep Creek

BULL RUN MOUNTAINS

Dry Creek

Crows Nest

White Gate

Crows Nest Gate

DUCK VALLEY INDIAN RESERVATION BOUNDARY

41°50'00"

116°15'00"

2 580 000 FEET

350 000 FEET

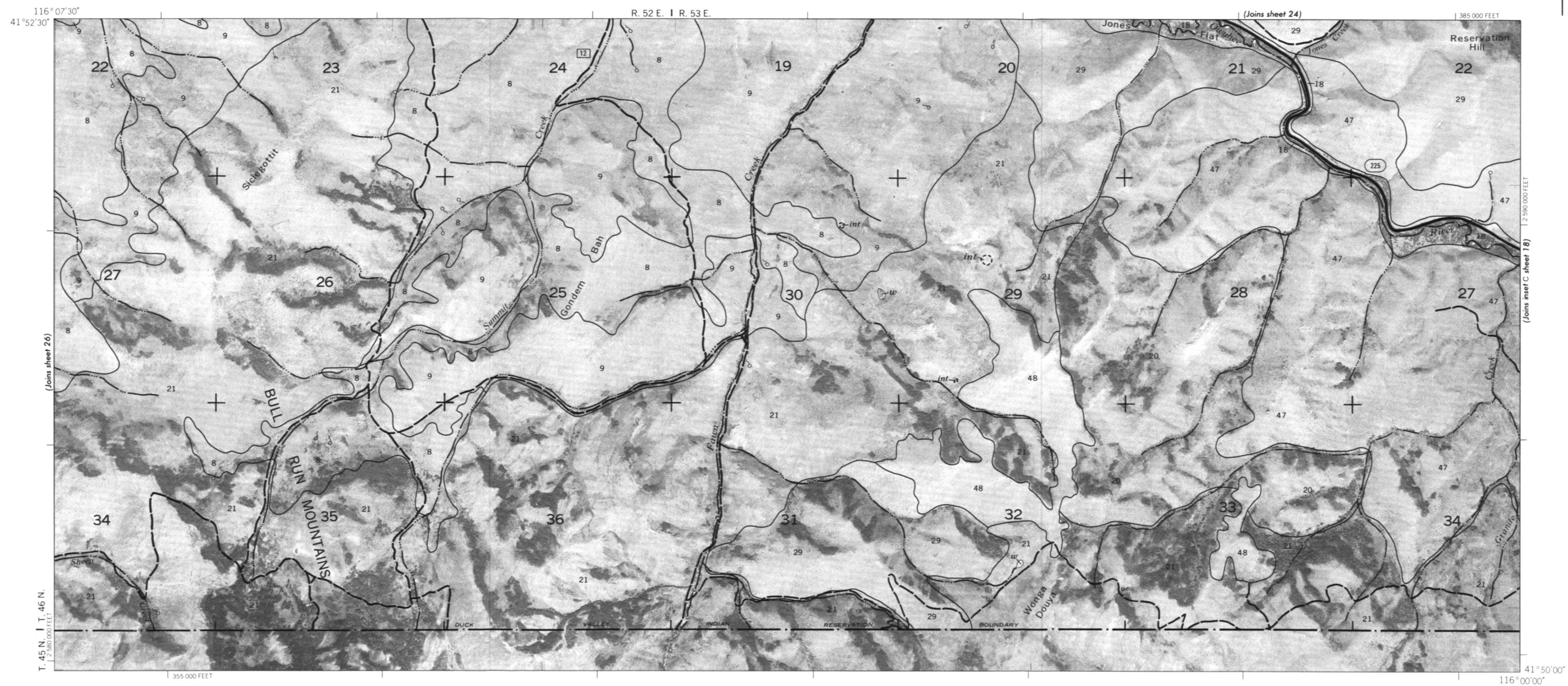
T. 45 N. | T. 46 N.

1 3/4 1/2 1/4 0 1 2 MILES

1 0.5 0 1 2 KILOMETERS

SCALE 1:24 000

DUCK VALLEY INDIAN RESERVATION, IDAHO AND NEVADA — SHEET NUMBER 27



1 3/4 1/2 1/4 0 1 2 MILES

1 0.5 0 1 2 KILOMETERS

SCALE 1:24 000